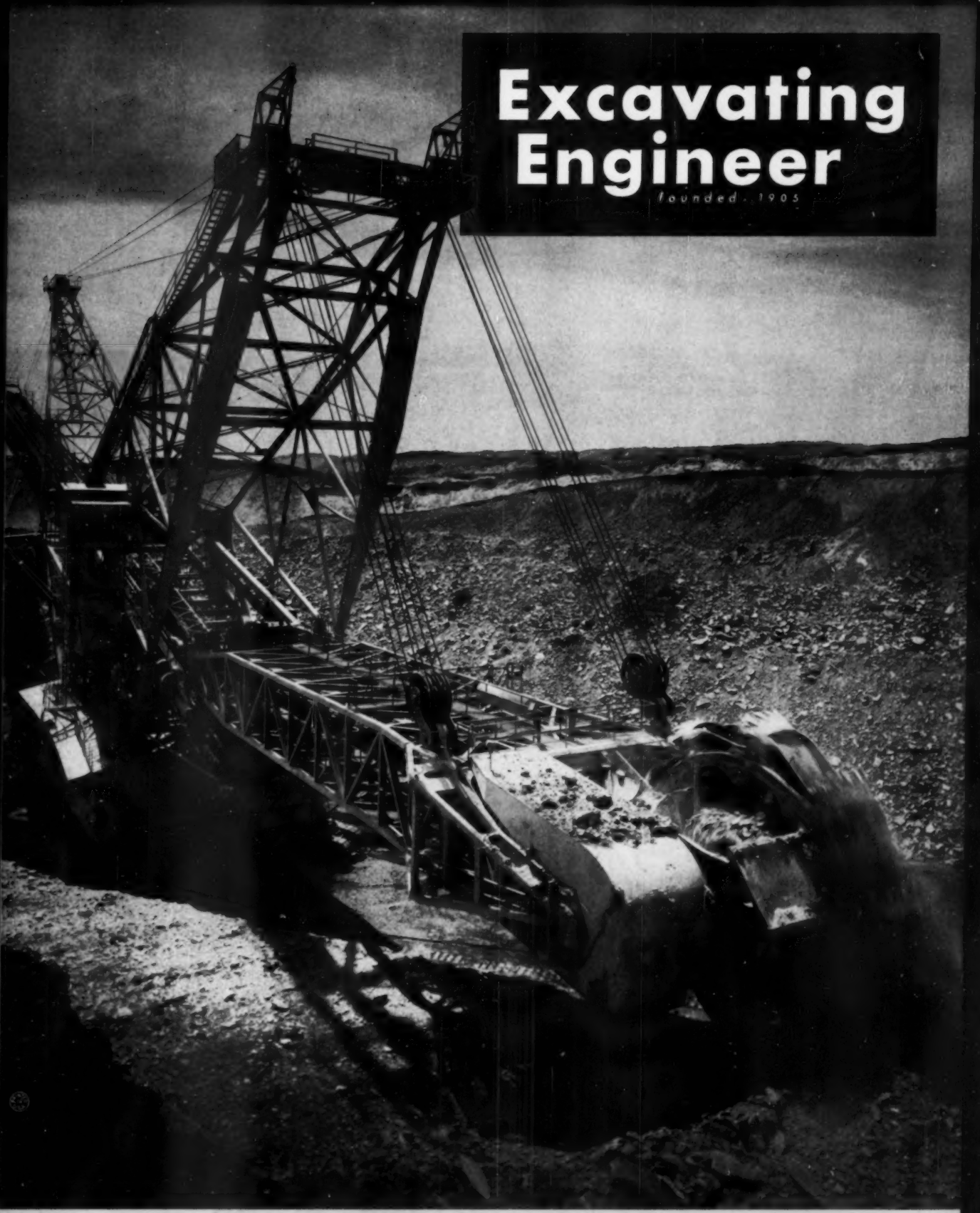
Excavating Engineer

founded · 1905



Vast amounts of overburden are moved by the Kolbe wheel excavator—a spectacular 2,100-ton steel giant working at United Electric Coal Companies' Cuba (Ill.) mine. A feature story begins on page 10.

AUGUST 1959

"The Age of Decision"

"Bet *your* Dad can't move thousands of tons of rock in a day. Bet he can't dig clean through a hill in five hours. He *can?* Wait a minute. Does your Dad run a Bucyrus-Erie, too? Shucks, I might have guessed it."

At this age, a boy like Billy accepts many things without question. His Dad's the greatest and so is the excavator he operates. However, one day he'll take over the reins of his father's business — and he'll discover Dad really did know what he was talking about.

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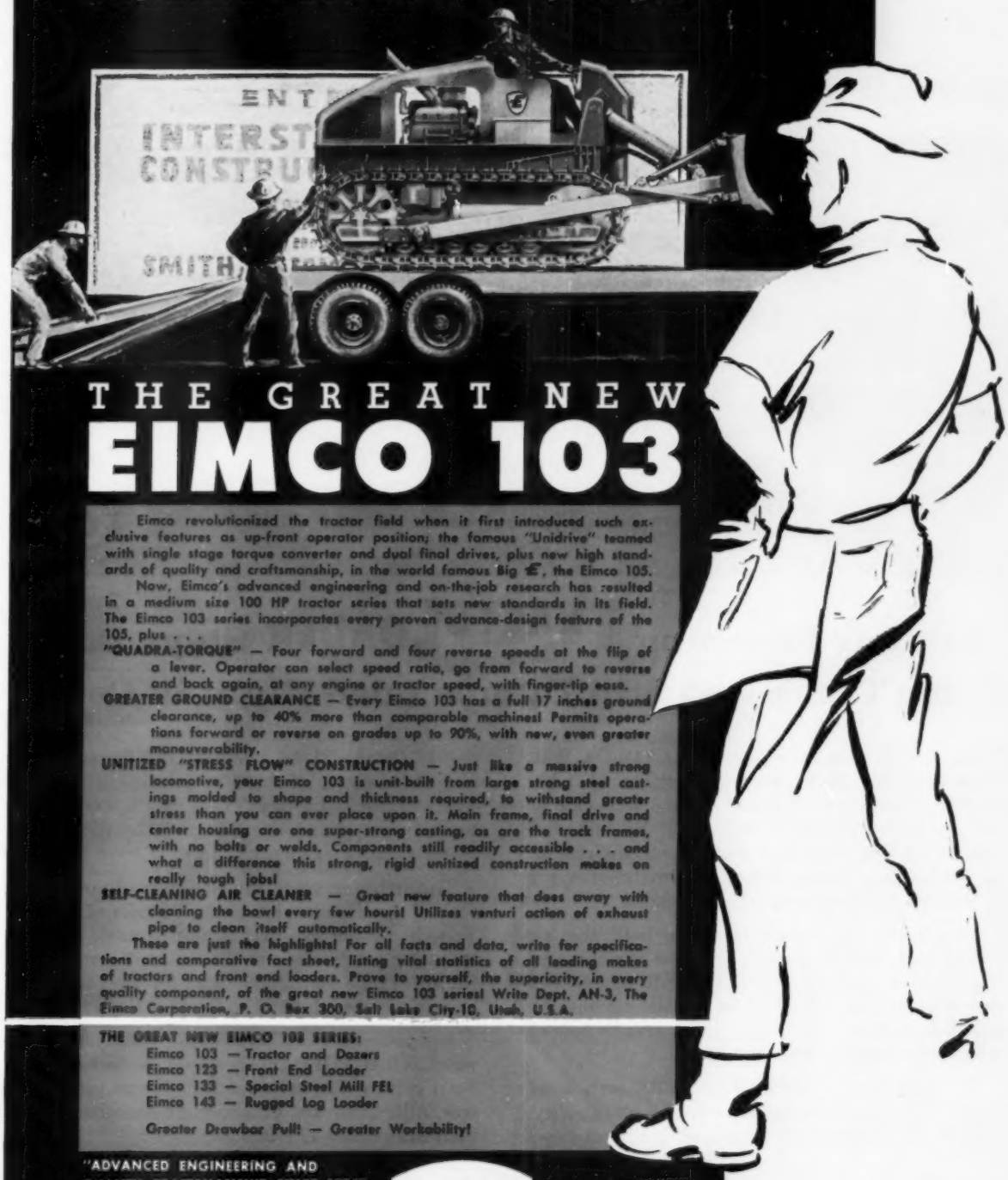

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

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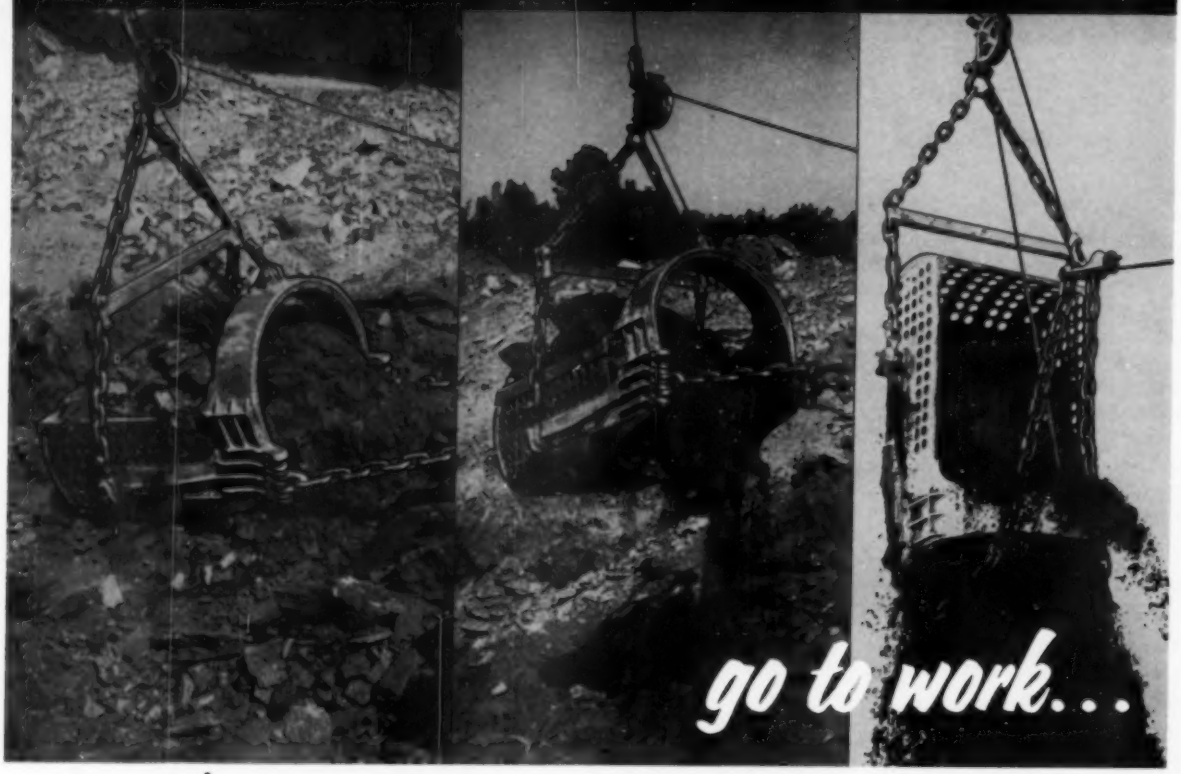

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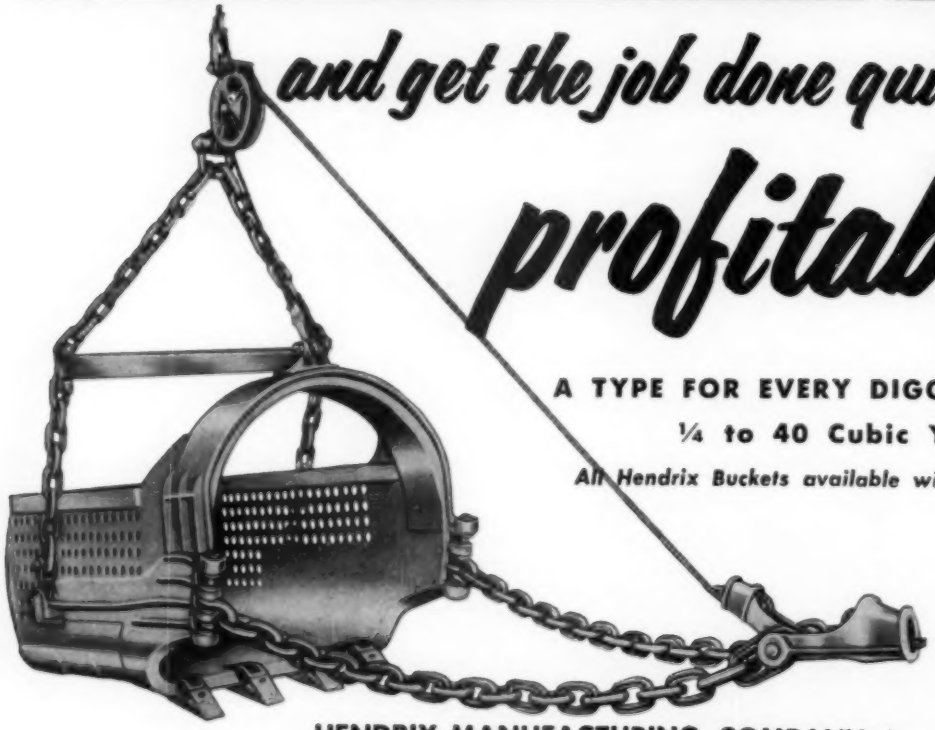

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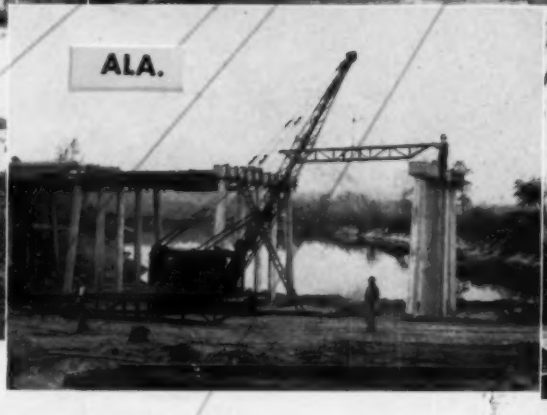

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G-98-LCO

Bethlehem wire rope along the Niagara. One of the country's busiest construction jobs is the Niagara Power Project now in full swing near the famous Falls. Being built under the direction of the Power Authority of the State of New York, it will harness the maximum potential on the American side of the Niagara River. Bethlehem wire rope is in constant use at many locations on the Niagara Power Project. Lifting a variety of heavy loads, and moving thousands of tons of earth and rock, it is providing the same dependable service as on less spectacular construction jobs throughout the nation.

Upon completion, this project will have an installed capacity greater than Grand Coulee Dam, currently the country's largest hydroelectric development. A new intake gate structure above the Falls will divert river water through four miles of underground conduits and one mile of open canal to the main 1,950,000 kw power plant. In addition, a pump-generating plant will produce an additional 240,000 kw during periods of peak demands. Treaty restrictions limit the amount of water which can be diverted from the river for power purposes, assuring that the grandeur of the Falls will in no way be diminished for tourists.

Bethlehem Steel Company, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem wire rope

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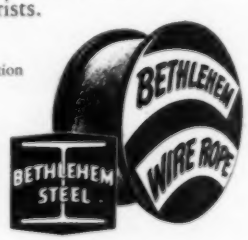

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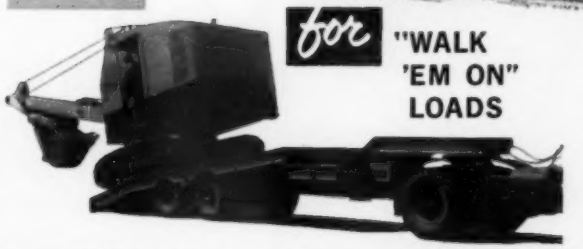
for QUICK LOADING AND FAST MOVES

The THPG Trailer's Patented gooseneck permits detaching, loading and reattaching in as little as five minutes; or it can travel with the deck above the normal position for increased roadway or below the normal position for decreased overall height clearance.

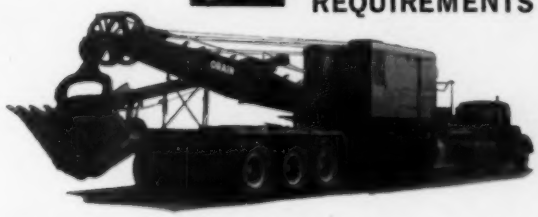
The hydraulic mechanism is operated by the truck's power take-off or by a gas engine mounted in the gooseneck adapting the trailer to operation by any tractor.



for "WALK 'EM ON" LOADS

Rogers Tilt-Deck Trailers are advantageous for hauling certain types of equipment—they load easily and are built in single and double axle models for varied requirements.

Some units have drawbars; others goosenecks for use with standard fifth wheels.



for MULTIPLE AXLE REQUIREMENTS

Efficient flotation and equalized loading on all tires are features of Rogers 3-Axle Trailers.

The Drop Deck Model (above) has minimum road clearance and loads quickly over the front by reason of the hydraulic detachable gooseneck.

Rear-axle is removable for shortened wheelbase.

Level deck 3-axle trailers have small tires and a sloping deck to facilitate loading. The entire length of the deck for carrying long equipment.

for GREATEST VALUE

The Rogers TVT Trailer is well named since it presents a value not even approached in any other trailer.

Rogers long experience, specialized engineering talent and uncommon facilities have produced units that have great capacity in proportion to weight, which haul and handle well and brake efficiently. The sloped deck facilitates loading.

for "LONG JOHN" LOADS

Rogers Pole Trailers are popular for hauling stacks, tanks, prestressed beams and other long objects.

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Now Caterpillar research gives you an advanced new way to shift gears. Operator simply dials desired gear. Split-second shifting. Available for DW20 and DW21

From Caterpillar's No. 1 Project* comes one of the most important earthmoving developments of recent years—*SynchroTouch Transmission Control.* This remarkable advance combines economical direct drive transmission with the easiest, fastest shifting imaginable.

SynchroTouch Transmission Control is an optional arrangement for Cat DW20 and DW21 Tractors that permits effortless shifting of transmission gears by means of a gear selector conveniently placed near the operator's right hand.

To shift up or down, the operator simply moves a selector switch to the desired gear. In less than a second it is engaged. The standard foot clutch is retained, but it is used only when starting from a standstill.

Fully job tested in the field, SynchroTouch Transmission Control is ready now to give you these important benefits:

1. Faster shifting—for faster cycles, more payloads per hour.
2. A significant reduction in operator fatigue—for more daily production.
3. Economical direct drive transmission—uses standard DW20 and DW21 transmission and clutch components.
4. No special maintenance required.

Add SynchroTouch Transmission Control to either the new DW20 or DW21 (Series G), and you have the last word in modern, high-speed, efficient earthmoving equipment. Both of these outstanding Caterpillar wheel-type Tractors are delivering more horsepower (345 HP), rimpull and capacity than ever before. Now, see them in action with the SynchroTouch Transmission Control!

Call your Caterpillar Dealer and ask to see a new DW20 or DW21 with SynchroTouch Transmission Control as soon as possible.

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HOW IT WORKS

SynchroTouch Transmission Control uses hydraulics as a source of power and is activated and controlled electrically. When the desired gear is dialed on an upshift, the following sequence occurs in a split second:

1. Control Unit signals master clutch to disengage.
2. Control Unit signals hydraulic system to shift transmission to neutral. Shifting collar is disengaged from present gear.
3. Generators notify Control Unit when transmission is synchronized for shift (shifting collar and desired gear at same RPM).
4. Control Unit signals hydraulic unit to shift to desired gear. Shifting collar engages new gear.
5. Control Unit signals master clutch to re-engage. SHIFT COMPLETE.

*Caterpillar's multimillion-dollar research and development program—to meet the challenge of the greatest construction era in history with the highest production earthmoving machines ever developed.

Excavating Engineer
founded 1905 AUGUST 1959

Kolbe wheel excavator strips an average of 3,500 yards of overburden an hour and conveys it a maximum distance of 420 feet.

Unveil Giant Wheel Excavator

ONE of the world's largest earth-moving machines—the Kolbe wheel excavator—was demonstrated publicly for the first time June 17 at United Electric Coal Companies' Cuba mine. The strip mine is located at Cuba, Ill., about 35 miles southwest of Peoria.

The wheel excavator, towering 150 feet high and weighing 2,100 tons, was put through its paces for a group of top executives of coal companies, industrialists, public officials and representatives of the press. More than 250 persons inspected the big steel giant and toured mine facilities as guests of Frank F. Kolbe, president of United Electric. Kolbe, who has headed the firm since 1939, played a major role in designing the machine which bears his name.

Stripping machine at United Electric Coal Companies' Cuba (Ill.) mine moves overburden at an average rate of 3,500 yards an hour. Bucyrus-Erie acquires plans and patents of the unit.

Huge Dimensions

The big crawler-mounted machine has a 45-ft. diameter roller circle—7½ feet larger than the swing circle of the largest shovel built in the United States. Overall machine length from the digging wheel to the end of the stacking unit is 420 feet, far greater than the size of any stripping shovel or dragline currently used.

While the theoretical digging capacity of the unit is 4,800 cubic yards per hour, its owners expect to obtain an average of about 3,500 yards per hour on a yearly basis. Excavating range extends from 9 feet above the coal bed up to 100 feet. Excavated material is conveyed on an endless belt, speeding at 1,225 feet per minute, a maximum distance of 420 feet from the high wall—and then it is discharged

on the spoil bank an additional distance of 25 to 30 feet gained in the trajectory of the falling material.

Guests were brought to the Cuba mine by special train from Chicago and by bus from St. Louis. Luncheon was served on the mine property, followed by brief addresses by President Kolbe and W. L. Litle, chairman of the board of Bucyrus-Erie Co., South Milwaukee, Wis.

Purpose of the special tour was to demonstrate the digging ability of the excavator to coal operators and to businessmen serving the industry. Coincidentally, United Electric announced sale of its plans and patents for the Kolbe wheel to Bucyrus-Erie.

Litle told the luncheon gathering that while Bucyrus-Erie has designed and built wheels of its own, Frank Kolbe pioneered the application of wheel excavators to coal stripping in this country. He said the machine may soon be used in large scale strip mining of uranium and other big earthmoving jobs in addition to its present application in the coal fields.

Bucyrus-Erie now has work underway on a large wheel excavator for the Peabody Coal Co. for use at its River King mine near Freeburg, Ill. This wheel will incorporate features covered by the United Electric patents.

Objective of the wheel is to move more earth farther at lower cost than is possible with other types of stripping equipment. In the problem of removing overburden, there are a number of factors that must be considered. The stripping shovel and dragline combination is not always the most satisfactory solution to these problems.

Unstable Bank

The instability of the top part of the bank of overburden, such as soft glacial drift, makes working a dragline near an open face a hazardous operation. This same instability makes it necessary to deposit the dug material at a considerable distance beyond the open pit to prevent slides. The wheel excavator technique overcomes both of these objections by traveling the machine on top of the coal and by placing the overburden as far back as the fourth and fifth previous cuts.

While the excavating range of the Kolbe wheel goes from 9 feet above the coal to 100 feet, it would be possible under certain circumstances to extend this range on other units of a similar type. The wheel excavator must be tailored specifically for the individual

Group of industrialists, coal operators and newsmen board the big excavator during special demonstration staged by United Electric. Buses brought tour group into pit.

Guests on the walkways of the digging ladder watch the wheel revolve at 8 rpm. Extremely quiet in operation, the wheel bites off overburden with a soft burring sound.

mining operation, since a great deal of design flexibility is possible.

Some of the officials present for the Kolbe wheel excavator tour included: Elliott Avery, Bank of New York; J. Robert Bazley, J. Robert Bazley Co.; Tilden Cummings, Continental Illinois National Bank and Trust Co.; J. Russell Coulter, Toledo, Peoria & Western Railroad Co.; John Garcia, Allen & Garcia Co.; H. C. Livingston, Truax-Traer Coal Co.; A. R. Matthews, Consolidated Coal Co.; Roy F. Miller, Aluminum Company of America; Frank Nugent, Freeman Coal Mining Corp.; J. F. Porter, Jr., Sallisaw Stripping Co.; Col. Charles Schweizer, U. S. Army Corps of Engineers, St. Louis (Mo.) district; A. H. Truax, Truax-Traer Coal Co.; W. A. Weimer, Peabody Coal Co.; C. W. Weldon, First National Bank of Chicago; and Paul Weir, Paul Weir Co.

During the demonstration, the visitors climbed out on the walkways above the excavator wheel and the stacker belt. They watched the rotating wheel move into the top of the high wall, bite off bucketsful of earth and pass it onto the endless belt conveyor system. The Kolbe machine is equipped with a half-mile long network of steel walkways and railings which permitted visitors to climb to any part of the superstructure.

The wheel excavator gets its name from the use of a 27-ft. diameter wheel with ten 2½ cubic yard buckets on it. In practice, the buckets actually hold about 1¾ yards of loose material. A chain mat forms the back of each bucket to provide continuous self-cleaning action.

Excavated material is discharged from the wheel to the belt over a roll feeder consisting of four steel rollers which rotate at speeds increasing from wheel to belt. The roll feeder performs three basic functions: allows buckets to dump at a lower position; permits using buck-

Excavated material is discharged from the buckets on the digging wheel to the ladder belt conveyor over this roll feeder.

W. L. Little, chairman of the board of Bucyrus-Erie Co., addresses luncheon group at the Cuba mine, discussing his firm's plans for building the wheel excavator.

ets of maximum width; and lets material cascade onto the belt without piling up.

From the digging ladder belt, the material drops onto the stacker belt which carries the material to the spoil pile.

The wheel itself is powered by one 715-hp motor at 660 rpm continuous, and 1,200 hp at peak kw. Variable speed control permits regulation for different conditions, but 8 rpm of the wheel is considered normal speed.

The wheel is powered from the motor by a 30-in. poly-V belt which helps provide the necessary clutching action to protect motor and reduce shock loads. The wheel itself weighs 90,500 pounds while the entire digging assembly, including all machinery, weighs 476,000 pounds.

Wide Belt

The ladder belt is driven by a 250-hp motor at 1,200 rpm. The stacker belt is driven by two 400-hp motors at 660 rpm. The stacker belt is 60 inches wide. It has a 5-ply, 7/16-in. top cover including five nylon cord breakers (one longitudinal and four bias) and a 3/32-in. bottom cover including one longitudinal breaker.

The operator's cab is located high up on the machine where the operator can see most of the important points, such as digging depths of the wheel, the discharge onto the conveyor and the full length of the conveying belts.

After the wheel excavator has dug through the soft upper portion of the overburden, tough layers of hardpan and shale remain. This material is dug by a 35-yd. Bucyrus-Erie 950-B stripping shovel which dumps the material on the near slope of the spoil pile. The shale formation must first be drilled by horizontal auger drills and it is then blasted.

Under the present stripping conditions at the Cuba mine, overburden is approximately 80 feet deep. The wheel excavator strips the top 45 feet of overburden to a point about 35 feet above the coal vein, leaving the remainder for the shovel. The depth to which the wheel strips varies with the type of material the 950-B shovel has to handle in various parts of the mine.

If the wheel gets too far ahead of the shovel, it takes a deeper cut until the two are closer together in their respective schedules. And, if the shovel is working faster than the wheel, the wheel excavator takes a shallower cut to enable it to get far enough ahead to keep an efficient working arrangement. Both the wheel and shovel work 24 hours a day on three shifts—seven days a week. Both the wheel and stripper are lubricated while in operation.

Overburden is stripped right down to the top of the Illinois No. 5 coal seam which averages 4 feet 8 inches in thickness and runs very level. After the coal surface is cleaned by dozers, the material is shot before being loaded.

Frank F. Kolbe, president of the United Electric, is the originator of the idea of using the wheel excavator as a tool for coal stripping in the United States.

The coal seam is loaded out by an electric-powered Marion 4121 shovel carrying a 7-yd. coal loading dipper. Working under the shovel are a fleet of eleven 35-ton Euclid bottom-dumps and two Caterpillar bottom-dumps with a capacity of 50 tons. One-way haul to the tipple over high-speed road is five miles. Only a small portion of the Cuba mine output requires washing. The

Stripping of overburden from coal seam is a two-step operation. After the wheel excavator has taken off the soft upper layers, a long-range shovel digs the remaining formation of shale which must be blasted. Shovel here is a 35-yd. Bucyrus-Erie 950-B.

Luncheon is served in the Cuba mine's big garage for 250 guests at the Kolbe tour, including coal industry executives, industrialists, public officials and newsmen.

graded coal moves by truck, rail and barge lines to users.

Cecil Clayberg is superintendent of the Cuba mine. Ray McAdams is pit superintendent, and Forbes Clarke is operations engineer for the Kolbe wheel excavator.

The idea of using a wheel excavator to move larger quantities of overburden at the Cuba mine was conceived by Kolbe in 1943. He and his engineering staff developed the company's first wheel, with a capacity of 1,000 cubic yards an hour, and it was put in operation in 1944 at Cuba mine.

During the next 15 years, three new wheels were built, each larger than the previous unit, and each incorporating structural and engineering improvements developed from practical operating experience. The machine demonstrated for the tour group is the last of this series.

The United Electric Coal Companies, one of the nation's largest exclusive strip coal mining firms, operates four mines in Illinois with a total production in 1958 in excess of 3,600,000 tons.

The company was one of the first to mine bituminous coal by stripping off the overburden. The present company was organized in 1918, its forerunner being a stripping operation, probably the first of its kind in the country, which was started near Danville, Ill., in 1885.

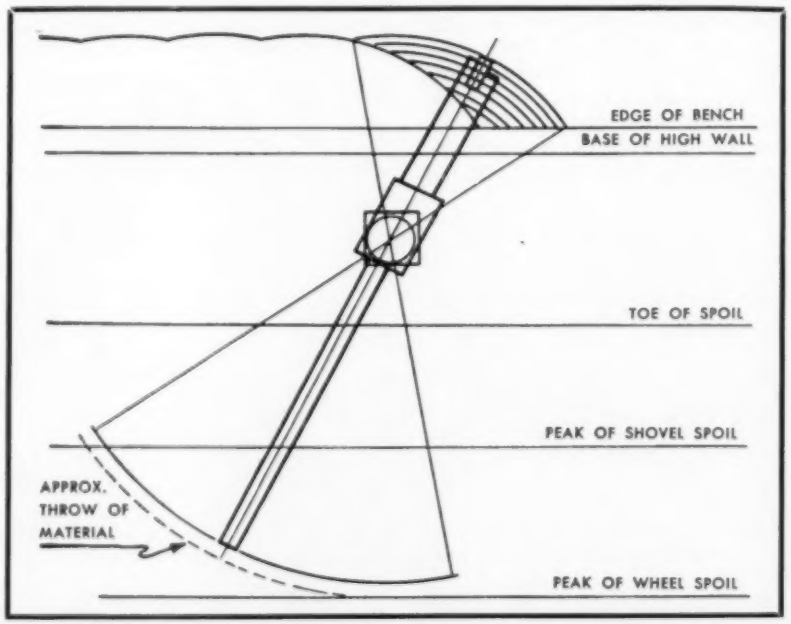
Million-Ton Mine

United Electric's Fidelity mine in southern Illinois, its largest, has produced in excess of 1,000,000 tons a year every year since it was opened in 1929.

Cuba mine, location of the new Kolbe wheel excavator, the company's oldest mine in years of operation, was opened in 1923. Today, it is one of the most modern mine operations in the country and is currently producing in excess of 800,000 tons of coal per year.

Buckheart mine, opened in 1937, is the company's second largest operation with a production last year in excess of 1,000,000 tons.

United Electric has been both fortunate and farsighted with respect to property locations and the development and utilization of water transportation. About 50% of the company's coal is moved to market via inland waterways



Plan of the wheel excavator operation shows the points where overburden is dug and cast. Machine conveys material a maximum distance of 420 feet, discharging its load on the spoil bank another 25 to 30 feet gained in the trajectory of the falling material.

at a considerable saving in transportation cost, thus permitting the shipment of United Electric coal to markets otherwise unavailable. Barges carrying the firm's coal ply the Illinois and Mississippi rivers the year round.

Recently, the company established joint facilities for the transfer of coal from river barges to lake vessels to make possible all-water movement of coal from Illinois mines to ports on both banks of Lake Michigan. This opens up additional outlets for production during the open navigation season.

One of the advantages of United Electric's early entry into strip mining has been its ownership of large blocks of strategically located coal properties, acquired in the 1920's at a time when strip mining was still relatively new on the scene. In 1929, when Fidelity mine first went into production as a million-ton-a-year operation, strip mining accounted for only 3.8% of national bituminous coal production. Currently more than 25% of bituminous production is from strip mines. The original reserve for this mine was more than 9,000 acres of which 3,500 acres have been mined to date. After 28 years of continuous operation at an average rate of more than 1¼ million tons a year, Fidelity still has many years of life ahead.

Total company reserves of strip coal stand at more than 85 million tons, the equivalent of more than 20 years production at the present annual rate.

Executive personnel of the United Electric Coal Companies in addition to President Kolbe are: John M. Morris, vice president, sales; R. J. Hepburn, vice president, operations; L. C. Sherrill, vice president, St. Louis office; and G. H. Utterback, secretary-treasurer.

Kolbe Wheel Excavator

Specifications and Performance Data

GENERAL

Over-all length (maximum)	420 feet
Width at center of rotation	46 feet
Roller circle diameter	45 feet
Height of discharge point above coal	119'-3"
Excavating range above coal (low)	9'-0"
(high)	100'-0"

DIGGING WHEEL

Diameter	27 feet
Number of buckets	10
Bucket capacity	2.5 cu. yds. (bank measurement)
Rpm (variable) normal	8
Swing speed at digging point	50-80 fpm
Max. capacity at 18" depth of cut	4,800 cu. yds./hr.
Max. depth of cut possible	36"

BELTS

Ladder belt	Width	60"
	Length	245'
	Speed	910 fpm
Stacker belt	Width	60"
	Length	700'
	Speed	1,225 fpm

ELECTRIC POWER

Motor-generators	2 @ 900 hp each
Wheel drive motor	715 hp @ 660 rpm
Ladder belt drive motor	250 hp @ 1200 rpm
Ladder crowd drive motor	100 hp @ 430 rpm
Roll feeder drive motor	40 hp @ 1170 rpm
Stacker belt drive motors	2—400 hp @ 660 rpm
Swing drive motors	2— 35 hp @ 700 rpm
Propel drive motors	4—150 hp @ 1200 rpm

SPEED REDUCERS

Wheel drive	83.14 to 1
Ladder belt drive	3.97 to 1
Stacker belt drive	10.076 to 1
Crowd drive	4.38 to 1

Crawler drive from 1,200-rpm motor speed to 14 ft. per min.

WEIGHTS

Wheel complete with motor & drive	215,500 pounds
Total weight of ladder & wheel	476,000 pounds
Total weight of machine on crawlers	2,100 tons

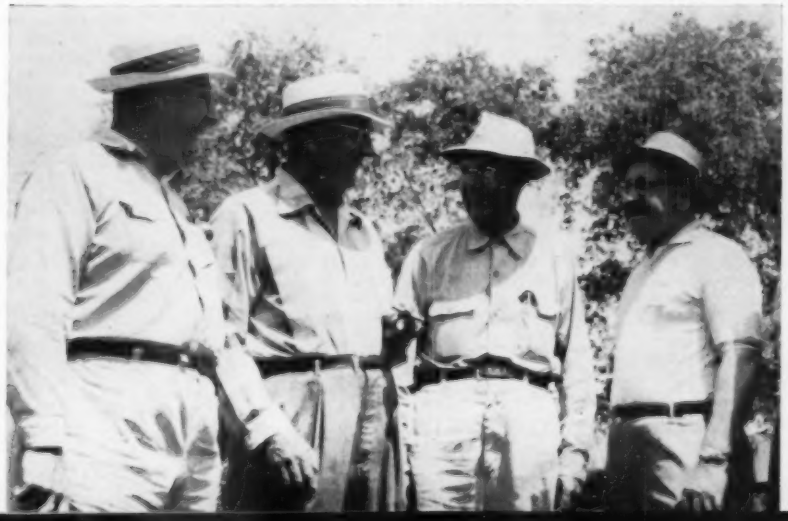
President Kolbe was born in Ann Arbor, Mich., and obtained his bachelor's and master's degrees in economics from the University of Michigan, where he taught for three years.

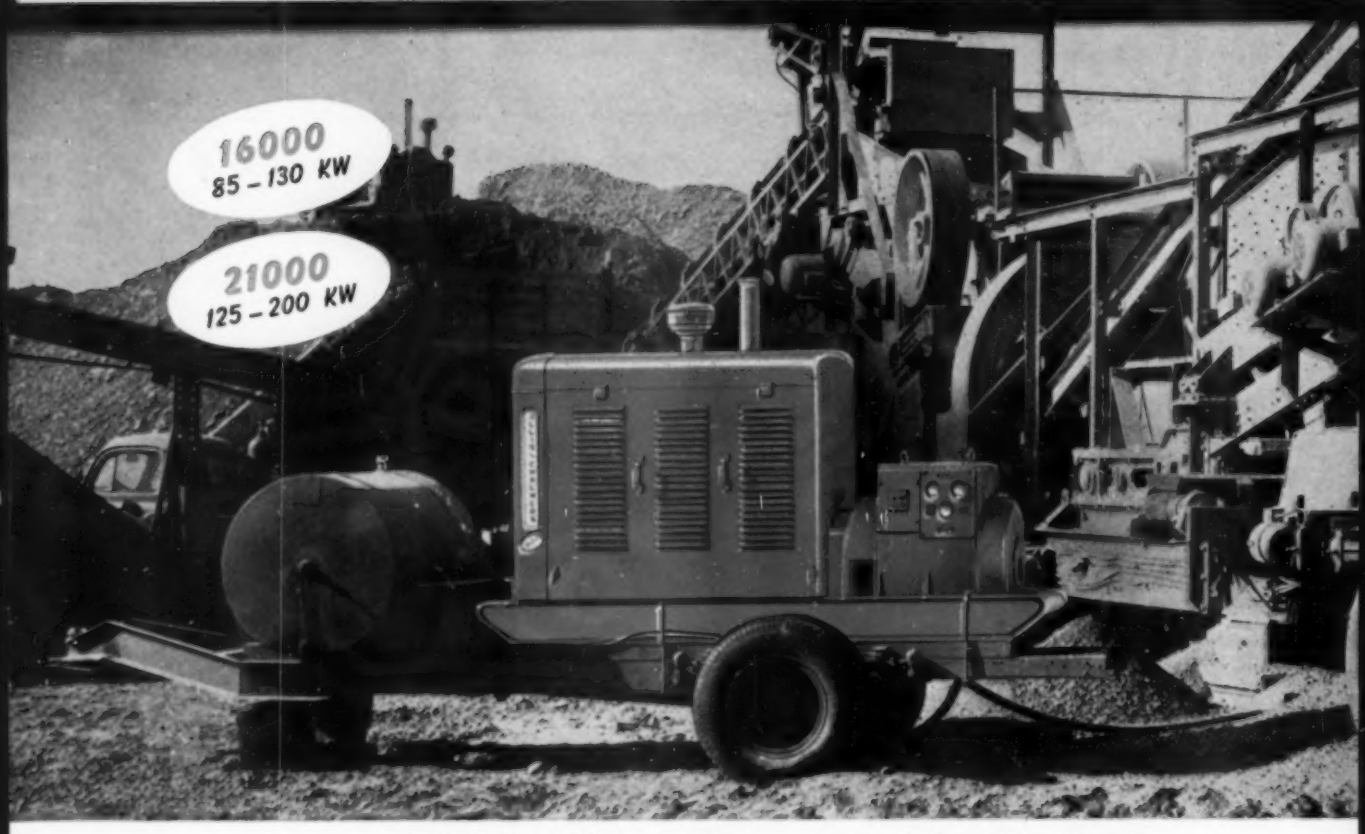
After two years in New York and Washington, he joined General Motors Corp. and served as assistant treasurer for six of his nine years with the company. Following this, he was active in private investment trusts for ten years, during which time he was also in partnership with Robert R. Young for about five years under the name of Young, Kolbe & Co., members of the New York Stock Exchange.

Kolbe became a director of the United Electric Coal Companies in 1935 and was elected its president in 1939. He is a director and a past president of the National Coal Association and vice president of the Chicago Association of Commerce and Industry, in charge of the transportation committee. He has served as a member of various other industry organizations.

Kolbe was chairman of a team of experts of the United States coal industry that went to Poland in 1957 on an exchange visit.

Lee Clayberg (right), superintendent of United Electric's Buckheart mine, acts as host for this group of visitors from the neighboring Fiatt mine of Truax-Traer Coal Co. They are Gene Long (left), mine superintendent; A. H. Truax, chairman of the board of Truax-Traer; and Byron Somers, former mine superintendent who recently retired.





This Allis-Chalmers 16000 diesel generating set provides electric power for motors on a crusher operating near Great Falls, Mont. Primary power source for the crusher is an Allis-Chalmers 21000 turbocharged diesel power unit, companion to the 16000.

NEW A-C DIESEL GENERATING SETS WITH BRUSHLESS GENERATORS

. . . offer 5 big advantages

1. Single manufacturer responsibility

Allis-Chaimers manufactures and stands behind all four major components that comprise these *complete* units — the modern diesels, the proved brushless generators, the rapid-response regulators and the switchgear. This means coordinated engineering, matched performance, undivided responsibility — an Allis-Chalmers exclusive.

2. Fast starts — Fuel savings

The modern diesels, with their unique, controlled combustion, start and pick up loads in 4 to 10 seconds. They save fuel, too. The 21000, for instance, saves 8½ to 27% in fuel over other diesels in its class. That's 1 to 2½ gal. of fuel in every 10!

3. Precisely regulated power

The new Allis-Chalmers magnetic amplifier type static voltage regulator has no moving parts or contacts. No parts to burn or wear. It has unequaled fast response to sudden changes in load. Precise power regulation protects sensitive apparatus, easily picks up heavy motor starting loads.

4. Brushless generator has new simplicity

There are no slip rings, no brushes, no commutators to wear or to spark. Newly developed, non-aging silicon rectifiers rotate with the armature and replace the slip rings, brushes and commutator. Brushless generators are ideal for operation in dusty areas or in corrosive or explosive atmosphere — provide unequaled electrical reliability.

5. Fast, easy unit installation

These sets are simple, unit-type, self-contained. They are mounted on husky skids — no special foundation is required, no danger of misalignment. Electrical connections are simplified, to speed installation and reduce related costs.

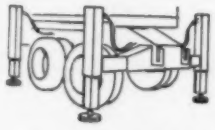
Your Allis-Chalmers dealer can give you complete specs, and assist in determining your needs. Call him or write Allis-Chalmers, Milwaukee 1, Wisconsin.

BG-36

ALLIS-CHALMERS

***POWER* FOR A GROWING WORLD**

This is a HYDROCRANE!

It will lift 24,000 pounds. Its outriggers  operate hydraulically and individually — within seconds to keep you level when you work. The controls are hydraulic — oil-smooth. The boom on a Hydrocrane is telescoping.

You can add 12 feet to your reach *on the move*, without stopping! The standard boom can be 24 to 36 feet long, the high lift boom can be 38 to 50 feet long — or even 70 feet long with the jib! The Hydrocrane travels over streets, highways, in plant yards as easily and fast as your pickup trucks. Does it work? It works so well that over 50% of the customers* who have ever bought a Hydrocrane, have bought another!

*Who are they? They're steel erectors, contractors and loggers. They're municipalities, utility companies, precast concrete people. And, there are many more every day. **See your Hydrocrane distributor for a free demonstration,** or write Dept. 15H, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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Builds Better Equipment

Top of the World Pipeline

by Ray Day

California's rugged mountain slopes are no barrier for a big spread laying a 58-mile long 20-in. gas line in rocky terrain. Much of the right-of-way passes through national forest area.

STRIKING straight as a die across mountains, valleys, rivers, railroads, populated and unpopulated areas, a new 58-mile gas pipeline is under construction in Ventura County, Calif. Being built for Richfield Oil Co., Los Angeles, the line will connect gas-producing wells in Richfield's Cuyama field with the Southern California Edison Company's steam plant near Ventura. Alex Robertson Co., Paramount, Calif., has the prime contract at approximately $2½ million for building the 20-in. OD line.

Assisting Robertson on six miles of the project is Ventura Pipeline Co., which has taken the section of the work which includes one of three river crossings. Two other major river crossings are being handled by Robertson, and are expected to be somewhat easier than the one near Ventura. From early indications, it appears as if a wellpoint unwatering system may have to be used.

Robertson's present problem is not with groundwater. It's the fact that the 58-mile job, started this spring must be finished within 90 days. The tight completion time is complicated still further by the fact that the line passes through some of southern California's must rugged mountain terrain. In some places, the bending machine must put 23° of bend in a 40-ft. section of the steel pipeline, and in other places from 1,200 to 1,400 feet of the line passes up or down grades as steep as 73%. Any good pipeliner knows that when equipment works on a slope much steeper than 60°, it must be literally supported 100% by other machines holding it from above.

Granite Outcrops

Rock formations, too, are difficult. The line passes through sections where there are great granite outcrops, and there are many hard sandstone areas. Many miles of the line pose the problem of partially excavating the ditch line with conventional trenching machines; then moving in all over again to drill and shoot the remaining portion of the trench and muck it out with hoes.

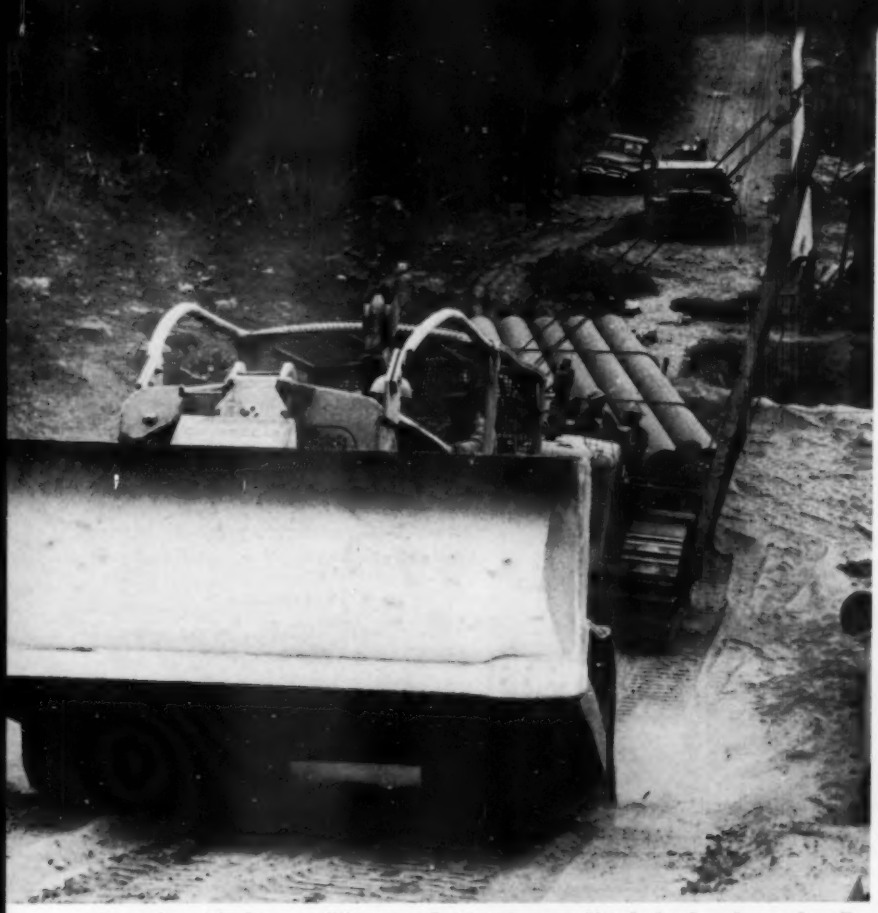
Speed and high production were the twin objectives in organizing the project. In addition to the six-mile section which was sublet to Ventura Pipeline Co., Robertson planned its operations around three separate spreads. That put four spreads on the job and, with equipment fairly well interchangeable between spreads, it gave the utmost flexibility from a productive standpoint.

The subcontract spread is of course operating near Ventura, the southern terminus of the pipeline. Robertson's spreads are scattered throughout the rest of the job.

One of the early problems centered around the necessity for starting the job immediately, and at the same time waiting for construction permits to be issued by the U. S. Forest Service. A considerable amount of the roughest right-of-way preparation is in a national forest area. For all practical purposes, that forced the contractor to hold off with some of the most difficult right-of-way preparation. The problem was solved later on, largely by bringing an immense quantity of machinery to bear to build up speed.

The magnitude of right-of-way clearing can be visualized in the unusual

The 20-in. gas pipeline passes through a remote section of national forest. Straight-line routing disregarded ridges and canyons.



On a pipe stringing expedition, two Cat tractors working in tandem drag a heavily-loaded sled up a slope. Steep grades on job often made truck delivery impractical.

equipment display on this activity. All told, Robertson and the subcontractor have 75 tractors on right-of-way clearing alone. These consist chiefly of Caterpillar D8's and D9's, with some International TD-24's. Practically all the right-of-way tractors are equipped with dozer blades and heavy-duty rippers, either Ateco or Kelley with H&L points. Most of the 50-ft. wide pipeline path is covered with low brush, such as scrub oak, manzanita, chaparral and California mahogany. Working in close cooperation with the Forest Service, the contractor has successfully disposed of this material.

Right-of-way preparation also has called for extensive excavation in its own right. One cut near White Ridge Mountain is 80 feet deep, and a spread of Cats worked there three weeks and three days before the cut finally was holed through. Extensive drilling and shooting also is being done in these jobs. The contractor has standardized on the use of Gardner-Denver twin drills mounted on Caterpillar side booms on the tractors. Most compressor power is furnished by 600-cfm Gardner-Denver rotaries, and Crucible drill steels, along with Timken carbide rock bits are being used to sink the holes. Patterns have varied all over the place as rock formations changed from granite through sandstone, and other types or hard-to-drill material.

One of the shooting requirements is that nothing but electric blasting caps can be used in the National Forest area. For that reason, drill holes are being loaded with Atlas 40% extra strength gelatin-type powder, and then shot—using delays if necessary into the side slopes—with Atlas Rockmaster caps. A hand blasting machine is used to detonate the shots. Because most of the heavy cuts are near canyons and washes, the bulldozers can get rid of the material with a short push without having to shove it great distances.

Throughout the job, right-of-way preparation has been a nip and tuck battle with time, because this phase of the work could not and did not get started as far ahead of the pipeline kick-off as it should have. It was also complicated by the necessary delay in getting Forest Service permits to pass through areas under the control of the government.

Made by Kaiser

The 20-in. pipe is being fabricated by Kaiser Steel at its Napa (Calif.) yard, and one of the features of its delivery is a long, 400-mile haul down through the San Joaquin Valley and U. S. highway 99 to the turnoff point which leads toward Ventura. Large-size Kenworth, Peterbilt and Autocar transport trucks are being used to bring the pipe down in 40-ft. joints. Delivery of the line, as well as stringing is under supervision of Progressive Transportation Co., of Compton, a firm which specializes in long-distance hauls and difficult access delivery.

Some of the pipeline stringing is unbelieveably difficult. In many sections it's impossible for trucks to get into the right of way at all, so that tractor-drawn dollies must be used to deliver the pipe. Progressive Transportation Co. also purchased several war surplus

Digging in the granite mountains is extremely tough as blasted trench shows.

Ditching machines like this Buckeye 315 dig stretches of soft ground. Equipped with H&L replaceable tooth points, the ditchers can successfully handle soft sandstone.

tank retrievers which can negotiate practically any type of terrain.

Scattered throughout the 60-mile route of the line, a number of modern, heavy-duty machines are busily engaged in digging the trench up and down hill, which will carry and protect the line after its final installation. Robertson recently purchased two ¾-yd. Bucyrus-Erie 22-B's, which can be equipped either as hoes or clamshells. There are also two American ¾-yd. machines, an American ½-yd. hoe, two Northwest 25's, a P&H ¾-yd. machine and an Insley.

Other trench digging equipment, especially for excavation in softer ground, includes two Cleveland 320 ditching machines, two Cleveland 240's and a Buckeye 315. These endless-bucket machines dig with H&L replaceable teeth points, and have successfully handled formations up to and including very soft sandstone. A considerable portion of the route, incidentally, passes through the tertiary sandstone formation common to southern California.

Much of the trench excavation being handled by hoes is unbelievably rocky and tough. There are places where seamed granite must be handled, and where powder charges, no matter how carefully placed, tend to dissipate themselves in cracks and fissures leading out from the trench sides. Slowly but surely, however, a pathway is being hacked out which will give the pipeline two feet of cover as a minimum in the remote sections; three feet in populated areas. The line is expected to have surge pressures as high as 900 psi.

Gardner-Denver twin drills on Caterpillar side booms are being used for trench drilling, along with Gardner-Denver 600-cfm rotary compressors for power. Tungsten carbide bits, usually of 2½-in. diameter, are being sunk to a point about eight inches below trench grade on 2½-ft. staggered centers. This tends to carve the trench out of solid rock with a line drilling effect. Smaller compressors and jackhammers helped to drill the small or more inaccessible spots.

Fire Hazard

Because of fire danger in the national forest, no chances are taken with thunderstorms or lightning, and everything loaded in a shift is shot at the end of that day. That limits the length of pipeline ditch shots to about 500 feet as a maximum, and leaves the location ready for hoes to move in.

Both Bucyrus-Erie 22-B machines are in the heaviest digging and have operated

Forest Considerations Important

Passage of Richfield Oil's 58-mile pipeline through the Los Padres National Forest posed a number of interesting problems, not only for Contractor Alex Robertson, but for officials of the U. S. Forest Service and engineering designers of Richfield Oil Co.

From the Forest Service point of view, the prevention of forest fires was of paramount importance. Even so, the Forest Service was happy to have the new line passing through its domain. The cleared 50-ft. right of way created a very efficient firebreak in many areas previously inaccessible.

The Forest Service relaxes more when pipeline work is on top of ridges, because it's safer then. The fire hazard is greater when a pipeline is in the bottom of a canyon, because fire starting there can spread both ways up the sides. Also, on the theory that a pipeliner out in the brush might smoke and create a fire hazard, the Forest Service strongly recommended that Contractor Robertson purchase and use disposable containers which almost fit in a man's hip pocket. The outcry of veteran pipeliners can well be imagined!

From Richfield Oil's engineering point of view, passage through the national forest was largely one of geology. As a rule, mountainous terrain is well defined. Ridges and valleys run about the same way. Here it was different. Nothing was even, and valleys which might run east and west in one place might turn north and south somewhere else. Ridges were the same way. For that reason, the location was made largely without the use of aerial photographs. It's a straight-line run between well-defined points, taking the ridges and valleys as they come.

Contractor Robertson's big problem, of course, is that he and his subcontractor must work with all these considerations. The precipitous location has stressed for the contractor the importance of ingenuity to get the line completed across rough terrain in the short contract period. So far as regulations of the Forest Service are concerned, they have been cheerfully adhered to, and—with a Forest Service representative on each spread—there has been no trouble whatever.

on 60° slopes. At one point, a 22-B machine was being held on the slope by four Caterpillar D8's, together with their Hyster winches and 1⅛-in. cable. Usual practice on the steep slopes is for the hoes to dig uphill, pulled slowly by the tractors, as each 5-ft. ditch increment is completed.

On some of the hoes, modern improvements of value to pipeliners have helped to increase trench excavation speed. For example, some of the machines can travel and swing simultaneously. That permits an operator to start moving while the machine is swinging over to dump its last dipper. It saves only a few seconds, of course, but at the end of a week, the saving in seconds is significant. Operators on all machines feel they've done a day's work if they excavate 100 feet of ditch each hour. There are many places, of course, especially where rock is extremely tough, where that type of peak performance is impossible. It also explains why it was necessary to bring in so many hoes to handle trench excavation.

It's a long struggle uphill for these Cats and a Crose cleaning-wrapping machine. The deep, tough right-of-way cut shows how the excavation mounts to great proportions.

Sharp Bends

The remainder of the project is equally well staffed with good equipment. Pipe bending, for example, is handled by three machines. There is a Cinch horizontal bender and two Crose-Cinch vertical-hydraulic bending machines. Bending crews know how tough the terrain is, because one of their worksheets called for a 23° bend in a 40-ft. pipe joint. The bends are, of course, carefully surveyed and outlined by an engineering crew, so that the finished pipeline will follow the contour of the terrain and rest easily in the excavated ditch. Extra care is taken in this regard, incidentally, by a contract specification which calls for cushion material in the trench bottom which is free from sharp, protruding rocks. The material is either hand selected from excavated trench material, or brought short distances and laid in the ditch bottom.

The pipeline, after being assembled by Cats and side booms, is being welded together with the help of the latest type of pipeline welders. Robertson has rigged up a number of 250 and 300-amp Lincoln welding machines, and mounted two such units on D6 and D7 Caterpillar tractors. These machines can go in practically any terrain. They are being used for stringer bead and hot

Some of the rocky material dug out of the ditch by this ¾-yd. hoe is shown in background. Operators figure they are lucky to dig 100 feet of trench per hour.

Three workmen make a clean, final patch of protective line coating just before the pipe is lowered into the waiting trench by sideboom tractors and several truck cranes.

pass welding work. Fleetweld 5P and Fleetweld 85 Prod are being used on the hot pass.

Firing line welding is being handled with 200-amp Lincoln welders mounted on sleds and towed by tractors. The cap bead is Fleetweld No. 5P.

M. J. Crose cleaning-wrapping machines are being used to remove all mill scale, rust and other deposits from the outside of the line just before the final protective wrapping goes on. This latter consists of polyethylene tape and 15-lb. Johns-Manville rag felt. The polyethylene tape is being wrapped dry and cold, and the use of a primer is unnecessary. The cleaning-wrapping machines have electric testing apparatus, which show holidays in the wrapping with electric sparks. If a defect shows up in the pipeline coating, it is corrected before the pipe is lowered in.

All possible protection is given the line during the lowering-in process. The line is cradled in the wrapping machine at all times, of course, and in addition the side booms, which sometimes handle the line at other points, use lifting belts which protect the pipeline coating.

Selective Fill

Protection to the line is carried on during the backfill process by selecting the fill as much as possible until the line is completely covered. Dozers are used for shoving the final backfill in over the pipe. One of the features of backfill is the Forest Service's concern about the possibility of dangerous erosion in the pipeline trenches. For that reason, after backfill is done, all right of way is being sloped and checked very carefully so that rainwater will run off under controlled conditions rather than under some uncontrolled basis which would produce dangerous cutting action. There are a number of places on high slopes where such protection takes the form of earthfilled sacks and groundcover planting.

Directing Robertson's operations are Project Managers Bob White and Kenneth Pratt. Spread superintendents include Jack Cheaves, Frank Sutton, Al Beasley and Ted Drewry. Two master mechanics service the far-flung equipment with a staff of mechanics, grease monkeys and helpers, who always have a tough job hauling fuel and lubricants into the machines on Cats. Master mechanics are John Newcomer and Ben Bone.

Robertson has rigged up twin Lincoln welding machines on D6 and D7 mountings. Here welders put together a valve assembly.

Heavy jobs like this are easy for the big new Cat No. 14 Motor Grader, working here on a section of Interstate Highway System near Corsicana, Texas. Owner: T. L. James & Co. Inc. and R. W. McKinney, Corsicana.

MOST VERSATILE BIG GRADER EVER DEVELOPED

—NEW 150 HP CAT TURBOCHARGED NO. 14!

The first and only Turbocharged Motor Grader, the big No. 14 delivers high production at low operating cost both on the roughest and finest grading work. It packs 150 HP and 29,280 lb. heft to handle heavy work quickly. Operates at the highest practical working speeds with either a 12-ft. or 14-ft. moldboard. You don't have to pick "spots" to make it pay off. You can use it profitably on many different applications such as:

—**power applications** like heavy grading, ditching, rough grading, bank sloping. Its low center of gravity provides extra blading and machine stability.

—**control applications** like light spreading, surface maintenance, fine grading and light blading. With Preco Automatic Blade Control, it controls blade slope within ⅛ in. in 10 ft.—cuts fine grading time in half.

Some of its many new features are shown here. For the complete picture, see your Caterpillar Dealer listed in the Yellow Pages of your telephone directory. Ask him for a demonstration. Pick the toughest applications you can find—see for yourself how the big, versatile No. 14 can handle any kind of hard work!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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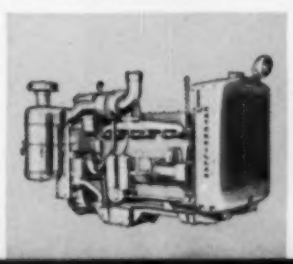
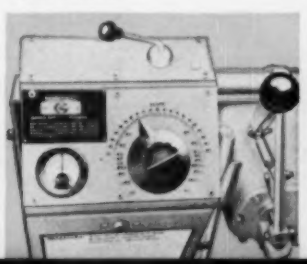
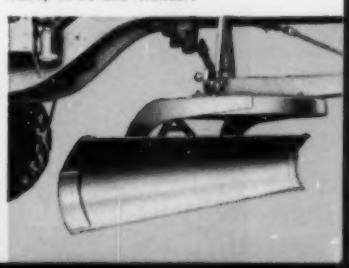


PRECO AUTOMATIC BLADE CONTROL. Optional. Operator selects desired slope on dial. Now transistorized, unit automatically controls blade slope within ⅛ in. in 10 ft.



HIGH THROAT CLEARANCE. New design permits increased clearance between moldboard and circle for greater loads. Also extra-strong frame, circle and drawbar.



Urban Highway Job Provides Tough Blasting

Proximity of homes and other structures to 900-ft. long highway cut limits size of lifts.

SUBURBAN districts of Nashville, Tenn., have been spreading rapidly outward during the past few years, gobbling up once rich, fertile farm country. This situation has appreciably curbed construction activities on a federal-aid road job just southwest of Nashville. The contractor has been largely forced to work within relatively confined areas and resort to the use of small equipment spreads.

The job involves building a four-lane highway along 3.4 miles of U. S. 70 South, which is the main through road from Nashville to Memphis, Tenn. Route 70 South becomes U. S. 70 some miles west of Nashville, where it is joined by 70 North, a branch highway leading into Nashville's northwest side.

The section 70 South being rebuilt will serve as a feeder road into Nashville for motorists traveling future Interstate 40. Although the interstate route—an east-west highway that will reach from coast to coast—is not scheduled to be completed for a number of years, 70 South is undergoing construction at this time to meet a more immediate need. It will straighten and widen a narrow, twisting stretch of roadway that has caused many deaths and has been long recognized as a serious traffic hazard. Costs of the project are being shared by the Tennessee state and federal governments on a 50-50 basis.

(Above) State Inspector John Bates points out roadway details to Job Superintendent C. R. Loveall. (Below) Blast holes are put down by a CTM Joy Challenger.

Burns and Baker Contractors, Nashville, is pushing the job. It submitted a low bid of $730,000 on a package contract covering grading, drainage, paving and other provisions.

Excavation requirements total 360,000 yards about half of which is rock work. The rock is largely in a 900-ft. cut located along a part of the road's new right-of-way that is bordered on each side by homes and other structures.

Take Precautions

To protect these homes and structures from possible damage, severe restrictions were placed on blasting. The contractor, as a consequence, has had to face the laborious task of moving limited quantities of the rock and yet keep pace with a fairly tight time schedule.

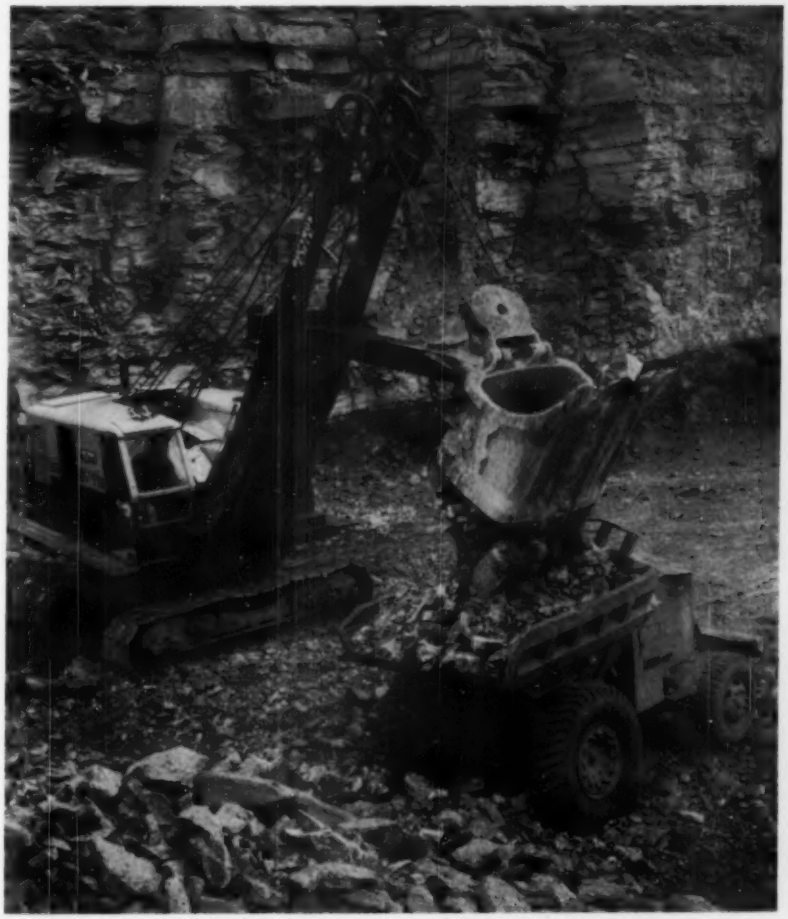
The Burns and Baker firm is meeting the rock challenge with a small but dependable and efficient spread of equipment that includes one drill, one loading shovel, two bulldozers and five hauling units. It also is using a blasting technique which has enabled somewhat

larger lifts to be shot than were originally allowed, and yet not cause damage to those buildings near the right-of-way. The technique involves placing instant caps in the center of a drill pattern and 25, 50 and 75-millisecond delay caps around its edges. This arrangement forces broken material inward upon detonation instead of hurling it upward and outward. The technique has another advantage. It produces nearly windrowed mounds of the rock, greatly facilitating and speeding the shovel's digging chore.

The cut contains a formation of abrasive blue limestone that is marked with occasional bands of low grade phosphate and scattered pockets of dull brown clay. Preparing blast holes in this material is comparatively easy, according to spectacled, stocky J. R. (Bob) Baker, who, together with his partner James H. Burns, runs the Burns and Baker firm. A single CTM Joy Challenger crawler drill has been able to handle the drilling task. It prepares enough holes to keep the broken rock supply well ahead of the shovel's loading demands.

The Challenger puts down about four holes per hour to an average depth of 20 feet on a 9 x 9-ft. pattern. Air power for the drill comes from an Ingersoll-Rand 600-cfm Gyro-Flo compressor situated near the drill site. Joy carbide-tipped bits of 3½-in. diameter size are used on Joy drill steel. Bit life varies. Generally, however, they are good for about 400 feet, resharpened four times on the job and then discarded.

Blasting takes place every other day. Some 60 to 65 holes drilled by the Challenger are filled to within eight feet of their collars with ammonium nitrate fertilizer. A few 2 x 8-in. sticks of Austin 60% gelatin-type dynamite are placed at the bottom and center level of the hole to help set off the nitrate. Primacord, used with du Pont instantaneous and millisecond delay caps, detonates the shots, which bring down between 2,500 and 4,000 yards of broken material each.



Shovel loads abrasive blue limestone into 6-yd. Koehring Dumptor. Material is hauled to fills extending immediately outward from both ends of estimated 180,000-yd. cut.

Fragmentation of the rock has been so good that "secondary drilling and blasting is limited to a half day's work a month," said Baker.

A 2-yd. Bucyrus-Erie 51-B shovel initially was rented by the Burns and Baker outfit from Euclid-Tennessee, Inc., Nashville, to ramrod the rock digging. The firm later bought the machine and modified it to carry a 2½-yd. Amsco dipper.

Cat D6 cleans up around shovel, which is shown at picture's right. Grading had to be postponed more than three months after contract was let because of bad weather.

Hauling Units

The 51-B swings over three 6-yd. Koehring model WD 60 Dumptors and two 22-ton Euclid rear dumps, which carry to fills extending immediately outward from both ends of the cut. The fill leading off the upper end is about 1,800 yards long; off the lower end it is about 1,000 yards long. Amounts of rock dumped in the fills vary in depth from five to 20 feet. The dumped material is

Dumptor empties rock in 1,000-yd. long fill leading off lower end of cut. Highway will have 24-ft. wide travel lanes in each direction, both with 12-ft. shoulders.

leveled out by a Cat D8 dozer, aided on occasion by a D6, whose primary duties are maintaining haul roads and cleaning up around the shovel.

At the project's outset, grading was postponed a few months because of extremely wet weather. To keep pace with a tightening time schedule and quickly cut figures of common excavation demands, the contractor has relied on a trio of Euclid S-12 scrapers, which have "lived up to expectations," said Bob Baker, "in getting the dirt work out of the way fast."

During the "wet season," the Burns and Baker outfit concentrated its efforts on meeting drainage requirements. The contract called for constructing five new box-type culverts, adding extensions to three existing box-type culverts and installing 2,500 feet of 15 to 66-in. diameter concrete and corrugated metal pipe. The new culverts range in size from the largest 10-ft. x 8-ft. structure to the smallest 3-ft. x 2-ft. structure.

Median Separator

Completed, the new highway will have two 24-ft. wide travel lanes in each direction both with 12-ft. shoulders. A 4-ft. wide slightly raised concrete median strip will separate opposing lanes of traffic on the 2.3 miles of new roadway running through open country. This will give way on the urban end to a painted median strip that must be maintained by the Davidson County Highway department.

Base for the travel widths will be a 14-in. blanket of aggregate containing stone of ¼-in. size and up. Specifications call for about 6,416 tons of this material, which must first be wet mixed with calcium cloride to keep down dust and then placed in 5-in. layers, each layer being compacted to a 4-in. thickness. A 250-psi binder course of heavy crushed rock will cover the base grade. Plant mix bituminous asphalt will be used as the topping course.

Burns and Baker Contractors is pushing the 70 South project with precision and smoothness. And there's a reason for the precision and smoothness—the firm's wide roadbuilding experience, which dates back to 1946 when it went into business as a sub-contractor.

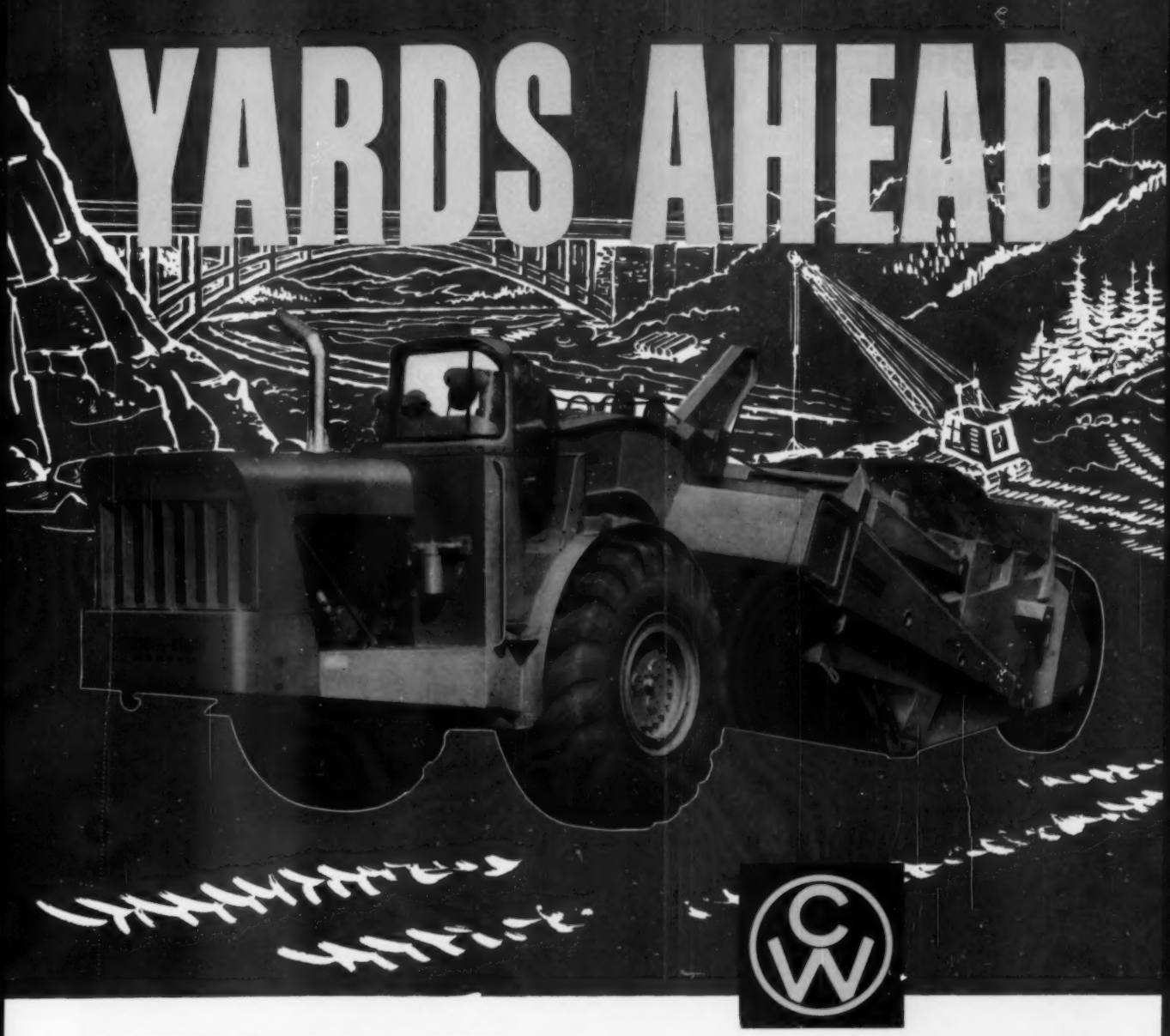
Recent Jobs

During the past few years Burns and Baker has had some pretty big jobs. These include a 7-mile long, $525,000 federal-aid project on state route 50 near Lynchburg, Tenn.; and two federal-aid contracts for grading sections of state route 96. One route 96 contract covered a 5-mile long $380,000 job in Dixon County. The other contract was a 6-mile long, $250,000 job in Williamson County. Both were finished in 1957. Concurrently with U. S. 70 South, Burns and Baker has a $1.5 million interstate highway grading task some 85 miles east of Nashville.

Job superintendent for Burns and Baker on the highway 70 South project is C. R. Loveall. R. A. Bruce is senior resident engineer for the state. He is assisted by T. B. Key, junior engineer. John Bates is state inspector.

A 22-ton Euclid rear-dump gets heaping load as it waits out last swings from the 51-B. Haul lengths vary each day, with an ever increasing time period for round trips.

YARDS AHEAD



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Dredging To Cut 77-Mile Ship Channel

First five miles of Mississippi-Gulf Outlet, completed to project dimensions of 36 x 500 feet, are shown here. New Orleans Inner Harbor Canal is at bottom of photo.

IN THE last century, construction engineers have done more to build or modify water traffic routes than ever before in history. Thanks to ingenious power machinery and construction know-how, the Suez Canal, the Panama Canal, the new St. Lawrence Seaway, and the Mississippi River navigation system now serve world commerce.

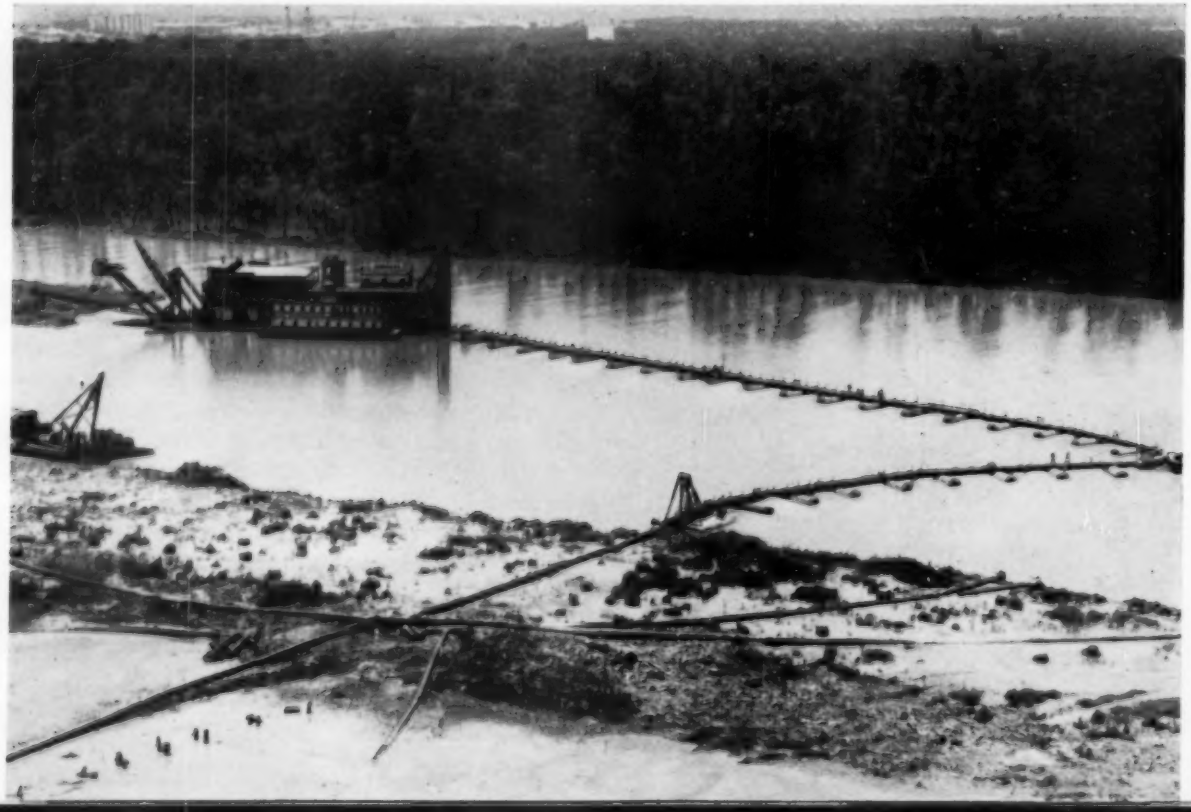
The latest in the ever changing waterway panorama is the Mississippi River-Gulf Outlet project now under construction by the U. S. Army Corps of Engineers of the New Orleans (La.) District.

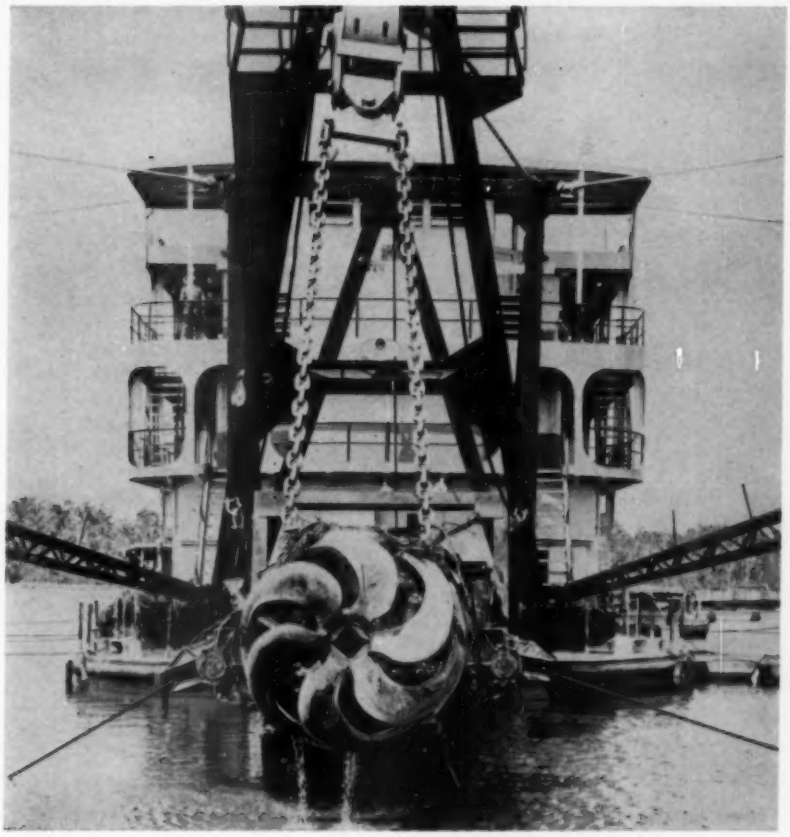
The Mississippi River-Gulf Outlet project involves the construction and maintenance of a new 77-mile channel from the Gulf of Mexico to New Orleans. Before it is completed, over 300 million cubic yards of material will be dredged, forming a channel 36 feet deep and 500 feet wide. Estimated total federal cost will exceed $100 million.

When opened to river traffic, the waterway will provide an alternate ship route to the port of New Orleans, thus

Powerful hydraulic pipeline dredge PAUL F. JAHNCKE is helping build a new ship route to the Port of New Orleans. Overall project will require 300 million yards of channel excavation.

Spoil dredged from the bottom by the *Paul F. Jahncke* and deposited on the river bank in the foreground will provide a suitable site, about seven feet higher than before dredging commenced, for the expansion of docking facilities and new industrial plants.





Dredge's 80-in. diameter impeller, driven at speeds of 250 to 360 rpm by a direct-coupled diesel engine, digs the river bottom at depths ranging from 10 to 70 feet.

providing for orderly expansion of the city's bustling waterfront.

Among the features of the project are an eased entrance at the Gulf, protective jetties and wing dikes at the entrance, a retention dike across Chandeleur Sound, a turning basin and a bridge across the channel near the New Orleans end of the project. The location of the proposed channel is indicated in the map on page 30.

Channel Description

The channel commences at the intersection of the existing Gulf Intracoastal Waterway with the Inner Harbor Navigation Canal approximately 7,500 feet north of the existing lock and approximately 11,000 feet from the Mississippi River. From this intersection the channel follows the existing Intracoastal Waterway in a generally easterly direction for a distance of 5.5 miles. The channel then leaves the Intracoastal Waterway via a 1° curve and continues approximately 63 miles in a southeasterly direction to and along the south shore of Lake Borgne and thence in a general southeasterly direction through the marshes to and across Chandeleur Sound to a point in the vicinity of Errol Island.

From this point an eased entrance is to be constructed gradually increasing in width from 500 feet to 600 feet and increasing in depth from 36 feet to 38 feet. This eased entrance extends approximately eight miles to the minus 38-ft. contour in the Gulf of Mexico. Protective jetties, extending out to the minus 20-ft. contour in the Gulf from Errol Island, will be constructed on each side of the entrance, as well as suitable wing dikes on the island to preserve it from erosion by wave action.

The channel route crosses approximately 26 miles of open water in Chandeleur Sound. A retention dike which will protect the channel from the generally prevailing south and southwest winds and which will prevent the reentry of the spoil into the dredged channel will be constructed. This dike, or dikes on both sides if necessary, will be constructed from spoil protected by stone on the faces.

Near the New Orleans terminus of the channel a turning basin 1,000 feet by 2,000 feet will be provided.

The new route will enable vessels to save 40 miles of travel from the open Gulf waters to New Orleans. In addition to the saving in distance will be savings in time by enabling vessels to make a more rapid passage in a nearly straight channel.

The new channel, Army Engineers predict, will not be plagued by silting or shoaling from suspended matter washed down from upper reaches of the river. Nor will the channel be subject to extreme variations in water level. For the booming port of New Orleans, the channel creates elbow room for new wharves. Industrial expansion will be further encouraged by relieving the growing congestion of existing harbor facilities.

Two Jobs Underway

In such major projects, dredges have been an efficient tool. Through their very size, they can handle the removal of vast amounts of materials from river bottoms as encountered in the construction of a ship canal. The size and the performance of such dredges have continued to grow, improving in effectiveness with each major project. This is borne out in dredging operations now underway. It is evidenced in the first two contracts of the channel project awarded to Jahncke Service, Inc., prominent New Orleans dredging and marine contracting firm.

Handling this dredging operation is one of the most modern large dredges in

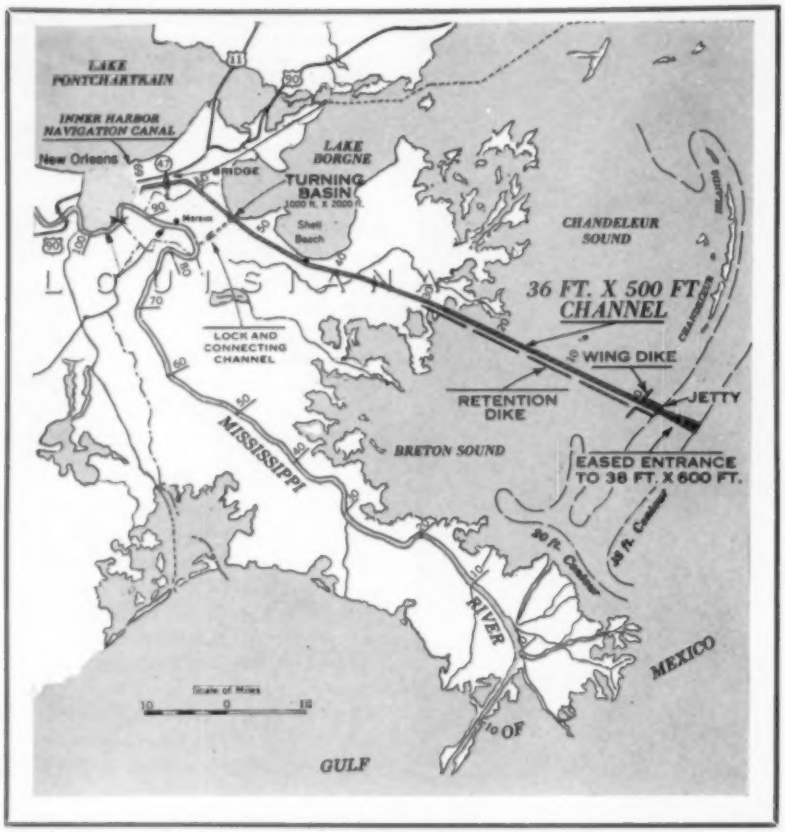
THE PROJECT

Authorization: Public Law 455, 84th Congress, Approved March 29, 1956

AUTHORIZED FEATURES	DESCRIPTION
Navigation channel	36-ft. deep x 500-ft. wide, 69 miles long
Eased entrance at Gulf	36-ft. x 500-ft. increasing to 38-ft. x 600-ft., 8 miles long
Jetties	Parallel jetties, Chandeleur Islands to 20-ft. contour in Gulf
Retention dike	Across Chandeleur Sound
Turning basin	1,000-ft. wide x 2,000-ft. long near New Orleans, La.
Highway bridge	Four-lane bridge for Hwy. No. 47 (Paris Rd.) crossing
Lock & connecting channels (when economically justified)	Ship lock 110-ft. wide x 760-ft. long x 40-ft. deep, vicinity Meraux, La.

PERTINENT DATA

Channel excavation	300,000,000 cu. yd.
Jetty stone	1,120,000 cu. yd.
Estimated federal cost	$101 million



Color line shows location of the new channel which will cut the distance from open waters of the Gulf to New Orleans to 77 miles, 40 miles shorter than the Mississippi.

the Gulf Coast area. It is a 24-in. hydraulic pipeline unit, the *Paul F. Jahncke*, named for the corporation's board chairman.

Constructed by Jahncke at its Madisonville (La.) yard, the dredge was designed by the Ellicott Machine Corp., Baltimore, Md. The dimensions of the hull are 170 feet long, 40 feet wide and 12 feet deep.

Large Diesel Engine

Powering an Ellicott heavy-duty dredge pump that is the heart of the dredge is a Cooper-Bessemer LSV-12 turbocharged diesel engine, capable of delivering 3,700 hp at 360-rpm crankshaft speed. With its inherent slow crankshaft speed, the engine is directly coupled to and turns an 80-in. diameter dredge pump impeller at speeds between 250 and 360 rpm. Through governor control, the engine delivers full load torque over the entire speed range.

Working around the clock, the *Paul F. Jahncke* is removing material from the new canal bottom at the rate of 50,000 to 55,000 cubic yards of material per day.

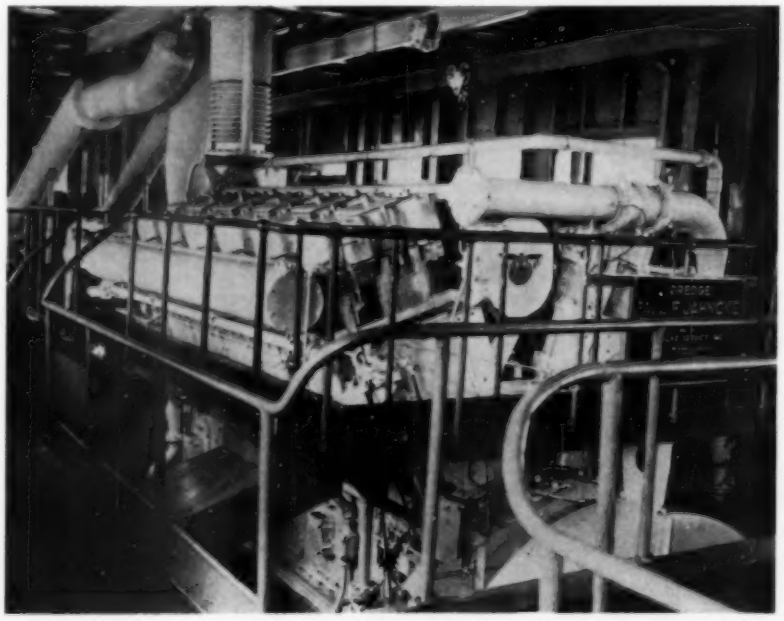
Power for auxiliary machinery comes from two 900-hp General Motors model 12-567 diesel engines. Each engine drives a tandem arrangement of an AC generator and two DC generators and exciters to provide flexibility of operation under any load requirement. The arrangement also provides continuity of operation in the event of failure of an individual unit.

For ultimate efficiency, the *Paul F. Jahncke* features fingertip control and operation of all of the dredging operations by a single man in the lever room. This operator has direct communication with all parts of the dredge as well as radio contact with various boats of the fleet and shore offices.

The electrical control system aboard the dredge is also one of the latest and improved designs for quick, easy operation and simple maintenance. The dredging ladder, for example, incorporates a quick-removal section, enabling the dredge to dig efficiently at depths ranging from 10 feet down to a maximum of 75 feet.

Comfort of the dredge crew has been carefully considered. Seventy men have sleeping accommodations aboard, all in air-conditioned rooms. A completely equipped stainless steel galley with the latest electrical arrangements, operated and supervised by a group of four cooks, serves 70 to 75 men every day, contributing greatly to the spirit and congeniality of the crew aboard the dredge.

The new water route will require a minimum of five years to complete, according to Corps of Engineers estimates. In the not too distant future, ships from the port of New Orleans will be using the new seaway to the Gulf and then to ports in all parts of the world.



Cooper-Bessemer 12-cylinder turbocharged diesel engine delivers 3,700 hp with the crankshaft turning at 360 rpm.

6 Crawl-IR drills deliver

POWER-HOUSE PUNCH

at Rocky Reach Dam

This concentrated battery of fast-acting, mobile drilling power is sinking 25 to 30 foot holes for the main power house excavation at Rocky Reach Dam on the Columbia River, north of Wenatchee, Washington. Under construction by the Rocky Reach Contractors, this major project is a joint venture sponsored by the L. E. Dixon Company of San Gabriel, Cal. For high sustained drilling speeds, these six Ingersoll-Rand Crawl-IR drills are using 2¾" Carset bits and I-R Carburized Drill Steels.

The Crawl-IR units are also used to drill 90 foot grout holes around the circumference of the coffer dam.

Ingersoll-Rand Crawl-IR drills are completely mechanized, heavy-duty units that convert setup time into *drilling time*. All motions—raise, lower, horizontal swing, extend, retract, and tower dump and swing—are powered by large, double-acting hydraulic cylinders, throttle controlled from a central operating station on each drill. Rugged I-R air traction motors, independently controlled, move the drill from place to place—permit fast, accurate hole spotting.

Ask your Ingersoll-Rand rock drill engineer for the inside story on why Crawl-IR is the strongest, most rugged crawler drill ever developed. Or send for new Bulletin No. 4208.

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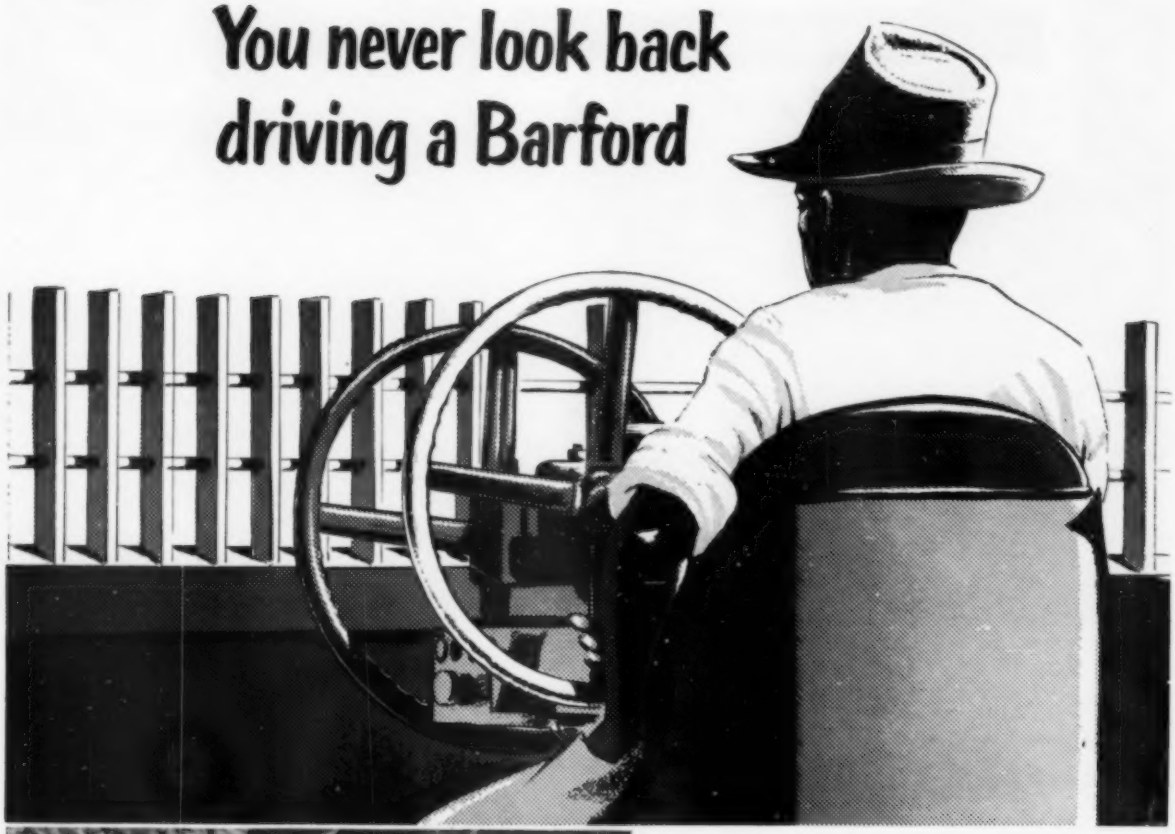

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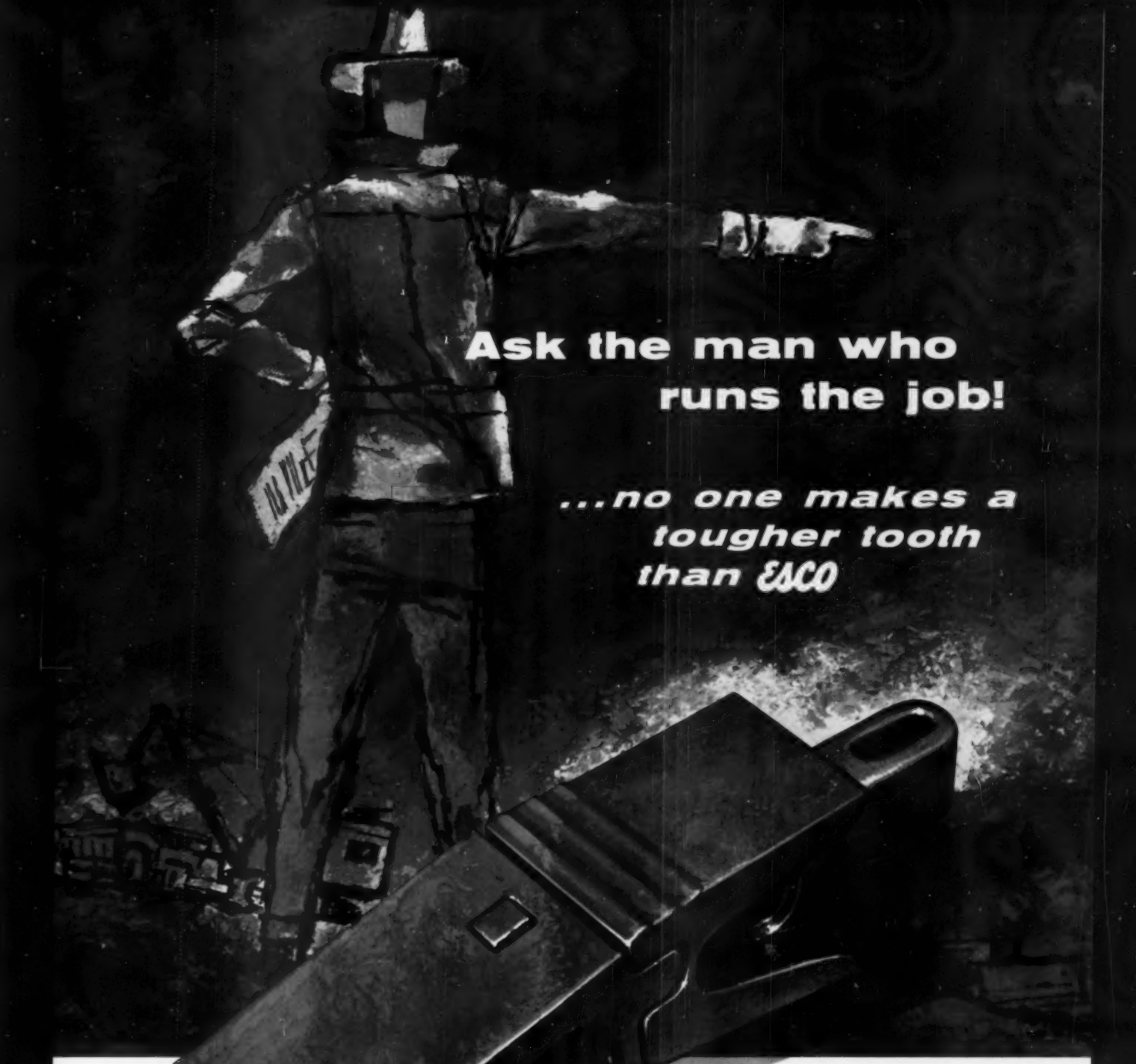

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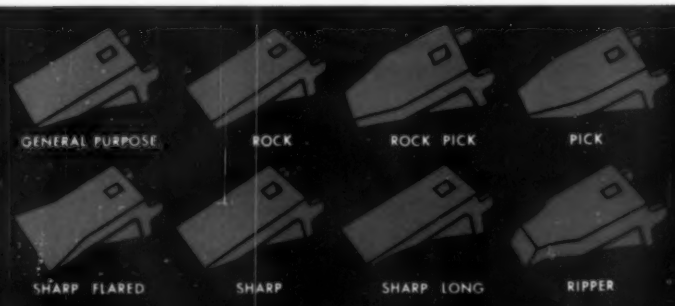

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has what it takes—and is ready to prove it

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Rock-Solid — and Twice as Tough — The 30-R levels instantly and stands firmly on three big hydraulic jacks . . . drills holes to 7⅞-in. diameter.

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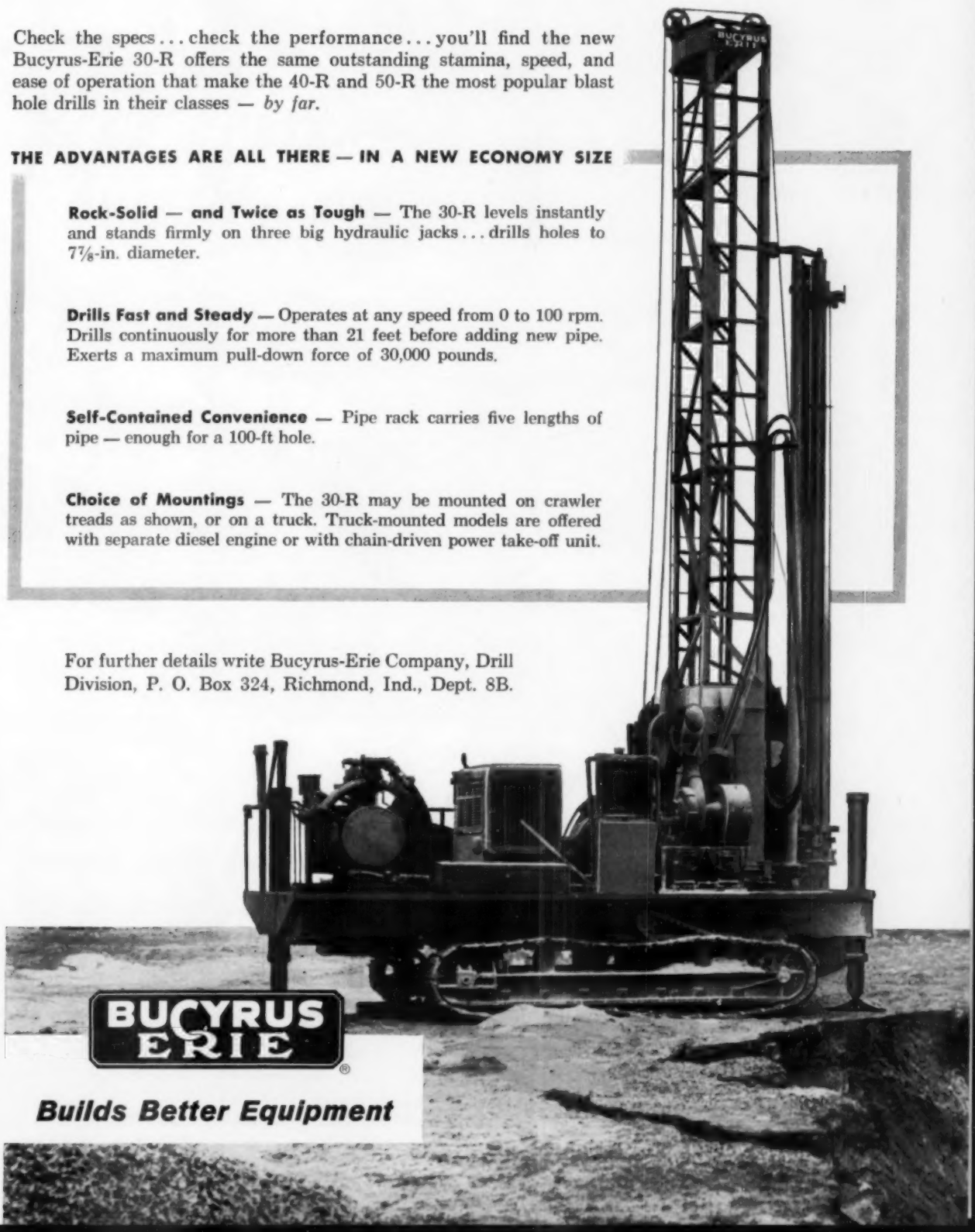
For further details write Bucyrus-Erie Company, Drill Division, P. O. Box 324, Richmond, Ind., Dept. 8B.



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Reliable performance of "Eucs" gives you a bidding advantage . . . helps protect your profit margin!

Building of the $137 million Keystone Dam, west of Tulsa, Oklahoma, on the Arkansas River, necessitates relocation of two main line railroads. One of these projects is 14.5 miles in length and involves 5,418,000 cu. yds. of earthmoving. Cosmo Construction Company has a 1.7 million-yard contract with the Army Corps of Engineers, Tulsa District, for two of the four railroad embankment sections on this big relocation project.

Cosmo is using 4 Euclid S-18 scrapers with 4-speed Torqmatic Drives and converter lock-ups. Material being loaded is of two types—hard shale and clay hardpan. A Model TC-12 Euclid Twin-Power Crawler and another tractor of over 200 h.p. push-load the scrapers. On round trip hauls of approximately 3500 ft., each S-18 averages 100 loads per 10 hour shift for a production of 220 bank yds. per hour.

Project Manager Stell Dobbs uses the big Euclid TC-12 for push loading the scrapers in the heavy shale—a very difficult material for scraper loading. In this way he makes effective use of the 425 net h.p. in the pusher and 336 h.p. in the scraper—Torqmatic Drive in both machines helps to make this combination a high production team on a tough job.

See your Euclid dealer for information on the complete line of Euclid earthmovers . . . he can show you how big power, big capacity, big performance "Eucs" can bring you a better return on investment.

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Scrapers Maintain High Production on Railroad Relocation Project

Here's big power at work . . . TC-12 "Twin" Crawler (425 net h.p.) and S-18 Scraper (336 h.p.) team up to get a 22 bank yd. load of heavy shale in a hurry.

Face of rugged southern Indiana limestone has been split into three benches at the Jeffersonville (Ind.) quarry of T. J. Atkins, Inc.

Hoosier State's Veteran Quarry Operator

T. J. Atkins, of Jeffersonville, Ind., who is recognized as one of the pioneer stone producers of southern Indiana and northern Kentucky, has been in the quarry business since 1919.

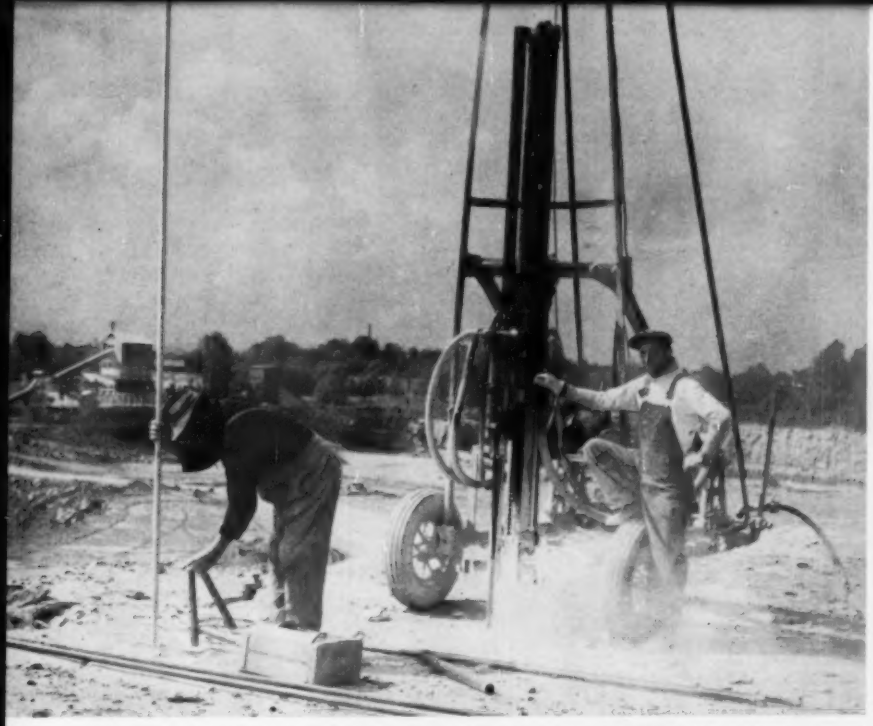
by Syd Jamieson

FORTY years ago Ted J. Atkins of Indiana's Floyd County learned how to operate a belt-driven Case steam engine from his father Joseph T. Atkins. The scene was a tiny hamlet called Lamb Valley, located about six miles north of New Albany, Ind. From this initial start with mechanized machinery, Ted Atkins took a liking to contracting.

Ted's father was in the sawmill and threshing business most of his life, and it was only natural that the son take an interest in some of the duties connected with his father's work. At the age of 18, T. J. Atkins started out on his own. His first job was operating a Springfield steam roller at $2 per day. His employers were Alex Stabler and W. F. Woodruff, contractors from Louisville, Ky., who were working a road job in a neighboring Indiana county. Other construction jobs followed. Then in 1919, through the help of Judge Bullitt, county judge of Kentucky's Fayette County, Atkins acquired a Case jaw crusher and a used Huber steam engine to begin his first quarry operation at Avon, Ky.

Early Methods

The following year Atkins moved his quarry operations to Doups Point, Ky., at the east end of Louisville. Today this location is the present site of the Lakeside Swim Club. With sledge hammers, crowbars, picks and shovels along with wooden wheelbarrows and coal gondola



(Above) Cleveland wagon drill is one of two at quarry for production drilling. Blast holes are drilled four feet back from the loading face and six to seven feet apart. (Below) After a 1,500-ft. haul, a 6-yd. truck empties its load into primary crusher.

be located. Loading the 1½-yd. gondola cars was figured on piecework and required one to two men per car. At times, a steam hoist was used to pull the gondolas upgrade to the crusher.

Atkins recalls his first delivery of crushed stone was for John Cahill, a Louisville contractor building a water-bound macadam road surfaced with blacktop from Louisville to West Point, Ky. This route was the old Dixie Highway.

Hauling of stone was always a major problem and during the next 12 years Atkins operated widely scattered quarries in Indiana and Kentucky. From 1940-48, he worked two quarries at the same time—Hartford, Ky., and Jeffersonville, Ind. However, in 1948 he decided to concentrate on one operation—that at Jeffersonville. This site was closely adjacent to his original quarry and contained 104 acres of rolling land harboring rugged southern Indiana limestone. The present quarry is located on the Hamburg Pike just east of U. S. highway 31-E. Hauling of stone from the plant is done entirely by truck.

Jake Hines (left), operator of 1½-yd. 38-B shovel, talks over production with Ted J. Atkins during a lull in loading.

cars, Atkins produced 400 to 500 tons of crushed stone per day.

The gondola cars were loaded and pushed upgrade under manpower to the primary crusher where the crushed stone was then loaded by chute from a bin into 40-ton railway cars. The railway cars were then hauled by a gasoline-powered locomotive of the Louisville Railway Co. over Louisville's streetcar tracks to wherever the job happened to

The open quarry face at Jeffersonville stretches for more than one-half mile. Atkins has split the face into three benches, working one bench at a time. Operating height averages about 65 feet, with overburden ranging in depth from 8 feet to 30 feet. The top bench height is 24 feet, the second bench is 29 feet and the bottom bench is 12 feet. Atkins estimates his quarry production consumes about an acre per year. Strip-

(Above) Newly acquired Hough HO Payloader works at stockpiles loading various grades of stone. (Below) Huber-Warco VD motor grader provides road maintenance.

(Below) International TD-9 dozer is a utility machine used for shaping stockpiles and also for sweeping quarry floor clean of rock spilled from trucks during loading.

ping overburden is done with a 1½-yd. Bucyrus-Erie 38-B shovel.

In fact, in all 40 years of operation Atkins has never bought any excavator but Bucyrus-Eries. When asked about his long-term standardization, Atkins simply replied, "Why argue with success? These shovels handle quite adequately our needs."

Loading stone from the quarry into International 6-yd. rockbed end-dumps, T. J. Atkins Co. employs another 1½-yd. 38-B. Teaming up with this machine, a 22-B crane breaks oversize stone with a headache ball. The company keeps a 1-yd. 30-B shovel for readying stockpiles and for loading and stripping as needed. Cleanup work around the shovels is done by an International model TD-9 bulldozer. Stripping operations are delegated to two IH model KB-6 4-yd. end dumps. However this varies to as many as five trucks—again depending on the need. Present quarry production is 200 to 250 tons per hour with the 38-B. Plant production at Jeffersonville runs about 200 tons per hour, but new expansion plans will increase this capacity.

General cleanup work and leveling of stockpiles is assigned to a Caterpillar D7 dozer. Sized stone from the stockpiles is loaded into trucks by the 30-B shovel, two Hough HO front-end loaders and one model HMD. A Warco model VD motor grader provides general road maintenance.

Easy Drilling

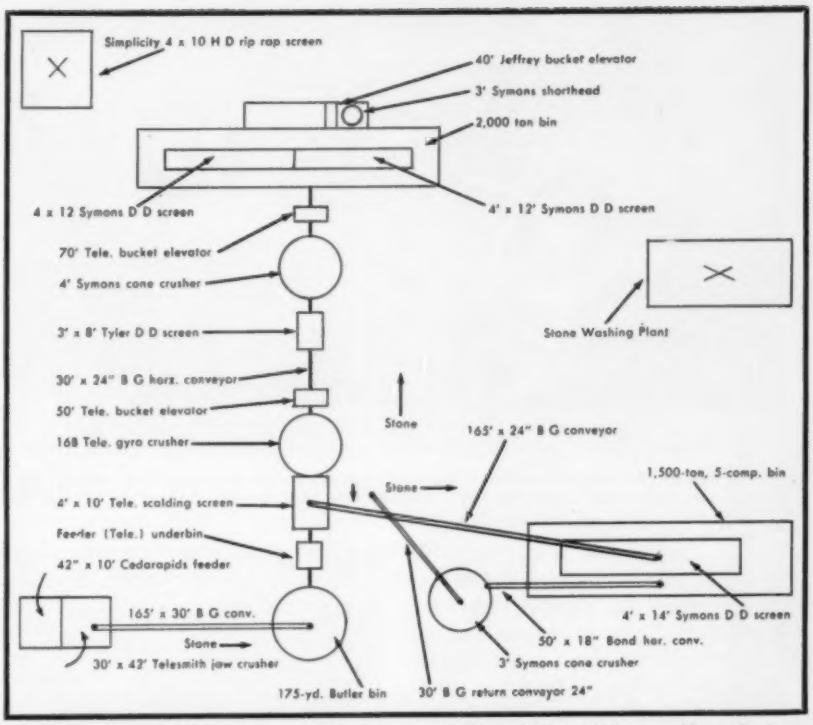
Two Cleveland wagon drills using a 14 x 13 Ingersoll-Rand stationary compressor provide the production drilling at the quarry. Holes are spaced four feet back of the drilling bank and six to seven feet apart. Hole diameter varies from 2¼ inches to 1⅞ inches. The average drilling depth is approximately 30 feet, and rate of penetration varies with the three benches. The best drill performance is one foot per minute; however, hard flint rock often doubles this drilling time. Churn drill bits are Timken and Ingersoll-Rand. Bit servicing is done by Contractor's Service Supply, Winchester, Ky. According to Atkins there is little secondary drilling. Large rock is generally broken by drop ball.

Explosive used is Atlas 40% gelatin detonated by delayed electric blasting caps. Normal size yield 1,000 to 1,200 tons. Fragmentation is good. Because of a sincere effort toward good public relations in the quarry area, Atkins has established a policy of limiting 30 holes per shot.

Due to a low floor in the original quarry site, Atkins in 1956 built an access road from the main plant to the bench faces thereby allowing a more efficient haul cycle and less severe grades. The average haul cycle is now six minutes to the crusher and return, including loading and dumping time. Length of haul from the present quarry operation to the primary crusher is approximately 1,500 feet.

Crushing Setup

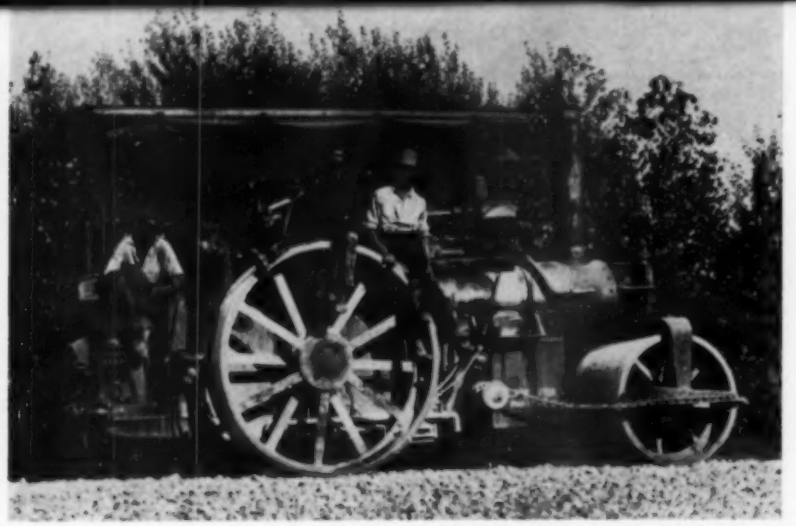
Plant operations begin with end-dumps delivering rock to a 42-in. x 10-ft. Cedarapids feeder. From this feeder the stone is directed to a 30 x 42 Telesmith primary jaw crusher. This primary crusher discharges the material to a 165-ft. x 30-in. Barber-Greene conveyor belt where it is carried to a 175-yd. capacity Butler surge bin. Stone from the bin is fed to a 4 x 10-ft. Telesmith screen for primary scalping. Leaving the primary scalping screen, stone two inches and under is carried to a new section of the plant by a 165-ft. x 24-in. BG conveyor where the material spills onto a 4 x 14-ft. double-deck screen. From the Symons cone screen, sized stone moves to a 1,500-ton five-compartment bin. Remaining in closed circuit, the unrequired stone sizes are carried by a 50-ft. x 18-in. Bond horizontal conveyor feeding a 3-ft. Symons cone crusher. Discharge from the crusher is then returned by a 30-ft. x 24-in. BG conveyor to the initial 4 x 10 Telesmith primary scalping screen.


Simplicity 4 x 10 H D rip rap screen
40' Jeffrey bucket elevator
3' Symons shorthead
2,000 ton bin
4' x 12' Symons D D screen
4 x 12 Symons D D screen
70' Tele. bucket elevator
4' Symons cone crusher
Stone Washing Plant
3' x 8' Tyler D D screen
30' x 24" B G horz. conveyor
50' Tele. bucket elevator
Stone
168 Tele. gyro crusher
165' x 24" B G conveyor
1,500-ton, 5-comp. bin
Stone
4' x 10' Tele. scalding screen
Feeder (Tele.) underbin
42" x 10' Cedarapids feeder
4' x 14' Symons D D screen
165' x 30' B G conv.
50' x 18" Bond hor. conv.
Stone
30' x 42' Telesmith jaw crusher
3' Symons cone crusher
175-yd. Butler bin
30' B G return conveyor 24"

Flow chart shows how quarry rock is processed through the Atkins crushing plant, beginning at the lower left with the 42 X10 Cedarapids feeder at the jaw crusher.

As the screen once again performs its scalping operation an elevator takes the material to a 16B Telesmith gyratory crusher. This discharge is then carried on a 50-ft. Telesmith bucket elevator and fed to a 30-ft. x 24-in. BG horizontal conveyor. Here the BG drops the stone onto a 3 x 8-ft. Tyler double-deck screen for secondary scalping. The overs are returned to a 4-ft.

A 1-yd. shovel loads stone from stockpile into truck. The machine is also used to ready stockpiles and for occasional stripping.



At the age of 18, Ted Atkins (third from left, sitting on wheel) operated this Springfield steam roller for Louisville (Ky.) contractors Alex Stabler and W. F. Woodruff.

Sullivan and Jim Kelley are familiar faces around the Jeffersonville plant.

Rogier, plant foreman, has been associated with T. J. Atkins Co., Inc. since 1929; shovel operator Plazzo worked his first shovel for Atkins in 1933. Office weighman Smith and operator-mechanic Sullivan have been with the firm since 1940. Kelley joined the company in 1942 at the outset of World War II. These five employees have a combined service of 92 years with the Atkins firm. Add the 40 years T. J. Atkins has himself and you have a lot of experience in quarry work.

Officers of the company in addition to Atkins, who is president, are Leon Hammer, vice-president, and John Bell, secretary.

Symons standard cone crusher while the unders by-pass the crusher and feed into a chute where this material is gathered by a 70-ft. Telesmith bucket elevator for distribution to a 4 x 12-ft. Symons double-deck screen. Atkins uses a dust screen below the double decker. The throughs drop from the double-deck screen for sizing. The overs are returned by gravity chute to a 3-ft. Symons short head cone crusher for recrushing. This material is returned by a 40-ft. Jeffrey bucket elevator to a 4 x 12-ft. double deck screen.

The sized stone is then distributed to a 2,000-ton compartment bin. The 1,500 and 2,000-ton compartment bins are used with considerable success by the Atkins firm and provide flexibility of sizing stone two inches and under, depending on the need. There are separate bins for tailings. Atkins also has a Simplicity 4 x 10 H.D. rip rap screen and a stone washing plant.

Recognized as a pioneer in quarry operations, the soft-spoken Atkins is sincere when he frankly admits "he enjoys quarry work." To Ted Atkins, "this is a hobby—not a worry for me." Perhaps that is why such men as Louis Rogier, Sam Plazzo, Cecil Smith, Ed

(Above) A 22-B crane disposes of oversize rock with its heavy skullcracker. (Below) Aerial of quarry shows layout. Access road at middle of photo was built in 1956.

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YOU DON'T WAIT FOR SERVICE...
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News from the Field

R. Barnwell Fuller Dies

R. Barnwell Fuller, 67, former general manager and assistant vice president of International Minerals & Chemical Corp., died June 2 at Lakeland, Fla. Mr. Fuller was a well-known figure in the Florida phosphate fields.

Born at Buford, S. C., Mr. Fuller began his mining career with a phosphate company at Bartow, Fla., in 1911. He joined International Minerals & Chemical in 1926 and served as general manager until 1953, when he was named assistant to the vice president of the phosphate division. He retired several years ago because of poor health.

Mr. Fuller pioneered the application of the largest walking draglines to phosphate mining. He was instrumental in the acquisition of International Minerals & Chemical's first big dragline, a machine with a 215-ft. boom and 20-yd. bucket, which went to work about 1945.

R. Barnwell Fuller

He was an active member of the American Institute of Mining, Metallurgical and Petroleum Engineers.

An avid fisherman and hunter, Mr. Fuller had a state-wide reputation for his work in conservation of natural resources. He was a member of the Florida Outdoor Writers Assn., and the Florida Audubon Society.

His business associations included a directorship of the Bank of Mulberry; director of the First Bank of Lakeland; and director of the Florida Power Corp. He was also district lieutenant governor of the Kiwanis Club; member of the national council of Boy Scouts; member of the state welfare board; member of the board of the Florida Children's Home; and a member of the Farm Bureau.

Mr. Fuller attended the University of Florida at Gainesville, and was recently awarded an honorary degree by Florida Southern College.

He was a member of All Saint's Episcopal Church, Lakeland.

Survivors are his widow, Mrs. Mabel Cardwell Fuller, of Mulberry, and two daughters and two sons.

Harold T. Reishus, vice president of the Construction Equipment Div., International Harvester Co., displays Engineer School merit plaque to Clarence A. Hubert (left), divisional general manager, and John W. Duncan, service training supervisor.

IH Receives Army Award

Harald T. Reishus, vice president of the Construction Equipment Div., International Harvester Co., Chicago, Ill., has received a plaque from the U. S. Army Engineer School, Ft. Belvoir, Va., for contributions to the training programs of the school.

Reishus' assistance has made it possible for Ft. Belvoir's Department of Mechanical and Technical Equipment to keep abreast of new equipment developments in military tractors, according to Brig. Gen. J. H. Dudley, school commander.

Gen. Dudley pointed out that the school drilled students on use of International TD-18 crawlers before these tractors were in the military system. For the first time, he asserted, trained personnel were in field units before the equipment was received.

The development, the general said, was an important "first" for the military.

International currently is supplying training aids, literature and technical assistance for the new TD-24 crawler tractor program at Ft. Belvoir.

Raymond To Build Kenya Road

The Government of Kenya, East Africa, has awarded an $11.2 million contract for construction of 300 miles of road to Raymond International Inc., a leading overseas general contractor with headquarters in New York. The joint venture contract is shared equally by a Raymond overseas subsidiary, Raymond International (U.K.) Ltd., London, and the Mowlem Construction Company, Ltd., of Nairobi, Kenya.

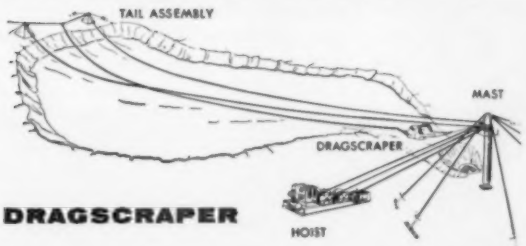
According to George F. Ferris, Raymond's president, work has now started on the four-year project, which involves

Continued on page 48

Cut Materials Handling Costs in Half . . . Dig *and Haul* with a Sauerman Machine

Operating costs as low as 6¢ per ton are reported by Sauerman DragScraper and Slackline Cableway owners. This cost includes labor, power and maintenance when digging free-caving material on average haul distances.

When you use a Sauerman DragScraper or Slackline Cableway, one machine does *both* digging and hauling from deposit to plant. No double handling is required. You cut labor and equipment costs in half—or even more—because a single Sauerman Machine, controlled by one man, replaces the multiple equipment needed for other methods.

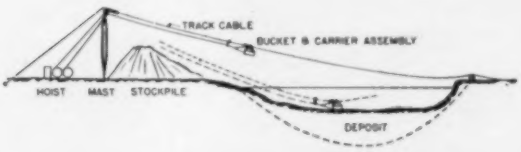


DRAGSCRAPER

DragScrapers are usually recommended for bank or pit deposits. They dig from hillsides or underwater as easily as on level ground and can haul directly to hopper or field conveyor. The Sauerman DragScraper hoist is designed for continuous duty and many years of service. The operator's control station may be remotely located for maximum visibility of deposit and plant.

DragScrapers are built in sizes from 1/3 to 15 yds. to satisfy practically all tonnage requirements.

SLACKLINE CABLEWAY



When deep digging is required or anticipated in the future, a Sauerman Slackline is usually best for the job. This powerful excavator can dig 100 ft. below water, lift its load and deliver the material to a stockpile on a 1000-ft. span.

The Slackliner Bucket inhauls at high speed and dumps automatically. Dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point, completing the fast operating cycle.

The use of a stockpile permits a single 2-yd. Slackline Cableway to handle the material requirements of a 200-tph. plant. Slacklines are built in sizes up to 3½ cu. yds.

★

Find out how you can save with a Sauerman Machine. Write or call, giving tonnage requirements and a description of your deposit. Sauerman engineers will supply their recommendations on the most economical machine for you.

SAUERMAN BROS., INC.

50th Anniversary Year

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CRESCENT DRAGSCRAPERS • SLACKLINE AND TAUTLINE CABLEWAYS • DUROLITE BLOCKS

Continued from page 46

about 50 miles of new paved road and 250 miles of rehabilitation and surfacing of existing road. Local labor and materials will be employed extensively.

Bidding Procedure Guide

How proper bidding procedure can pay big dividends is the subject of a new bidding guide prepared jointly by the American Society of Civil Engineers and Associated General Contractors, now available.

Low costs, sound design and better construction are high on the list of benefits to owner, engineer and contractor, according to the 12-page brochure. It is called *A Recommended Guide to Bidding Procedure on Engineering Construction.*

The document is not intended for use in drawing up building contracts. However, it has broad application in the heavy construction field. Vital areas specifically covered are 1) preliminary investigation; 2) plans; 3) specifications; 4) bidding; 5) separate contracts; and 6) sub-contracts.

Single copies are free. Quantity orders, two or more, are available at cost —25 cents a copy. Requests should be addressed to ASCE, 33 W. 39th St., New York 18, N. Y.

BPR Compiles Contract Statistics

A total of 11,102 federal-aid highway construction contracts worth $3.8 billion was awarded through the various state highway departments during the calendar year 1958, according to figures compiled by the Bureau of Public Roads, U. S. Department of Commerce. The figures represent about a 50% increase over the comparable 1957 figures of 7,386 contracts with a total value of $2.4 billion.

REPORT ON OPENING OF BIDS BY SIZE OF CONTRACT
Calendar Year—1958

Federal-aid primary contracts (including interstate) and federal-aid secondary contracts

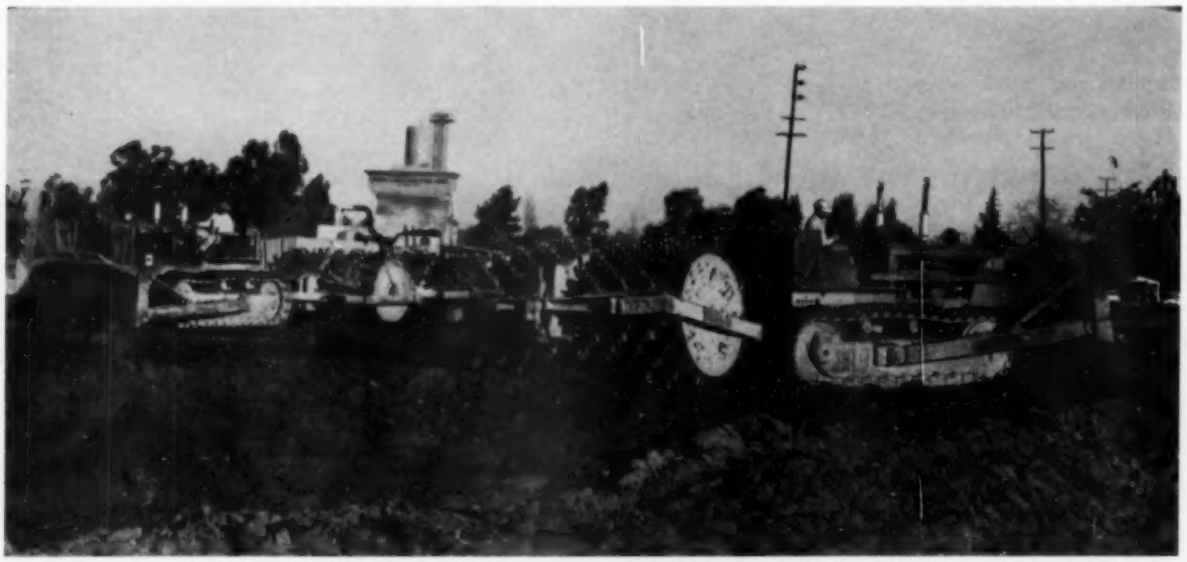
Size of contract (Dollars)	Total number of contracts	Percent of total contracts	Total amount of low bids	Percentage of total value
0-24,999	1,603	14.44	$ 24,072,500	0.63
25,000-49,999	1,743	15.70	64,103,500	1.69
50,000-99,999	1,878	16.92	135,173,600	3.56
100,000-249,999	2,523	22.73	411,629,800	10.84
250,000-499,999	1,519	13.68	540,393,600	14.23
500,000-999,999	959	8.64	663,272,800	17.46
1,000,000-1,999,999	526	4.74	739,775,700	19.48
2,000,000-2,999,999	177	1.59	434,884,400	11.45
3,000,000-3,999,999	84	0.76	288,075,800	7.58
4,000,000-4,999,999	42	0.38	189,063,200	4.98
5,000,000-9,999,999	46	0.41	286,814,100	7.55
10,000,000-14,999,999	2	0.01	20,724,800	0.55
15,000,000-and over	0	0	0	0
Totals	11,102		$3,797,983,800	

The 1958 contracts had an average cost of about $340,000, which was 4.6% higher than the 1957 average of $325,000. The 1958 contracts varied from less than $25,000 up to about $11 million, with an equitable distribution throughout the entire range. Thirty percent of the federal-aid highway construction contract low bids received by the state highway departments were for amounts less than $50,000. Another 17% of all contracts were for amounts between $50,000 and $100,000, and 23% were between $100,000 and $250,000.

About half the total number of contracts were in the range below $100,000, well within the possibility of participation by small business enterprises. The federal-aid program, as in the past, is attempting to encourage and develop the actual and potential capacity of small business.

As in 1957, the contracts in 1958 were mostly in the low and medium price levels, and progressively decreased in number as the large-size contract levels were reached. Contracts under $1 million accounted for 48% of the total contract cost involved, but represented 92% of the total number of contracts offered for bid.

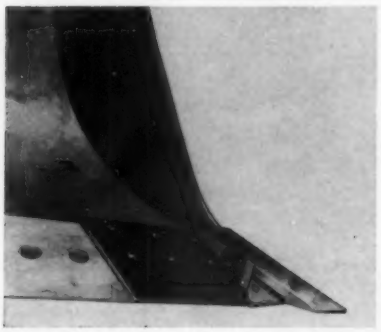
A tabulation of the contract figures appears above.



Roller derby participants are two International TD-24 crawlers pulling sheepsfoot rollers compacting two million yards of fill near Woodland, Calif. Oberg Construction Co. is building 3.9 miles of federal highway, which will extend Ventura Boulevard.

Equipment You Ought to Know About

Blade Corner Adapters



Manufacturer: H&L Tooth Co., Department EE, 1540 S. Greenwood Ave., Montebello, Calif.

Claims: The new H&L corner adapter with Flexpin-type tooth, puts sharp corners on bulldozer blades. The adapter and point are of forged high alloy steel.

The point pilots ahead of the blade, maintains accurate slope in cuts, and eliminates round corners. Bulldozers can move more material with less power and with greatly increased efficiency. The forged steel point stays sharp, and its Flexpin connection holds point securely. It can be changed by using only a hammer and punch. The corner adapters bolt in place of the original end bit, using the same bolt holes, and are available for all bulldozer makes and models.

Tractoloader

Manufacturer: Allis-Chalmers Mfg. Co., Department EE, Milwaukee 1, Wis.

Claims: The new model TL-16 TractoLoader announced by Allis-Chalmers is specially designed for speeding excavating-loading work in sand and gravel yards and on construction jobs.

The TL-16 weighs 18,000 pounds and has a carry capacity of 7,000 pounds. Available for use with the new

Continued on page 52

OWEN BUCKETS

new center line reeving doubles cable life

"Our new OWEN Bucket is great. That new center line reeving more than doubles our cable life," says Kenneth Muster, Supt. for R. F. Muntz, owner of the Hugo Sand and Gravel Co. of Kent, Ohio.

The tandem positioning of the lower closing sheaves permits the closing line lead to pass directly through the center of the head of the bucket. This exclusive OWEN feature eliminates excessive bending of the cable, resulting in increased cable life experienced by Hugo Sand and Gravel. It also permits the bucket to hang plumb from the crane boom.

This OWEN Clamshell, with all moving parts lubricated . . . with all arm and sheave pins, plus the main shaft, having triple lip grease seals . . . has heavily cut the high maintenance expense of handling this sand suspended in water that comes directly from the wash plant.

"Our operation is tough on a clamshell, but all these improved OWEN features have greatly reduced our maintenance costs and cut down-time," claims Mr. Muster.

Send us your requirements.
OWEN Engineers are at your service at all times.

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Berkeley, Calif. • Fort Lauderdale, Fla.

Only proven International® delivers bonus

Blade a bonus load—flip the Shuttle-Bar—and you reverse the TD-15 instantly and reposition fast! New TD-20 and TD-15 owners, the country over, are reporting "next-size-bigger" production from these proven models!

Bonus track roller life really counts for this TD-20 owner, working in the "grinding compound" of water-borne granite particles. Precision-lapped, full-floating, metal-to-metal seals in proven International track rollers provide never-before-equalled protection to keep out abrasives and keep lubricant in!

Years-Proven Planet Power Steering, unequalled undercarriage strength and ease of control make the TD-24 what many contractors call "the rock-dozing special" of all king-sized crawlers. "Live track" steering with both tracks pulling *full time* means bigger loads every push!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

dependability tough-job performance!

Only International provides heavy-duty-type track-rollers—the "originals," since 1956, with cartridge-type, floating metal-to-metal seals. Only International gives you heavy-duty roller bushings and king-size lube reservoirs, plus husky, big-diameter track roller shafts. Exclusive pressure relief passages guarantee positive prevention of seal blow-out or damage from power lubricators! Measure the advantages of proven International roller design in longer wear life, and downtime prevention!

Only International gives you the proven power-transfer efficiency and design simplicity of sintered metal-faced, dry-type engine clutches. With simple, uncomplicated operation, this heat-defying clutch operates efficiently at all temperatures—reduces lever pull up to 50%—needs no cooling system—delivers proven low upkeep!

Only International gives you proven exclusive cycle-speeding, load-increasing features—that pile up bonus production on tough or easy jobs. Only the TD-24 gives you Planet Power "live" track steering advantages—eliminates "dead-track drag"—pulls or pushes the same big loads on turns or straightaways—gives Hi-Lo power-shifting of either track on-the-go! And both TD-20 and TD-15 give you 6-speed, full-reverse transmissions with "single-stick" shift, and fast Shuttle-Bar forward-reverse control!

Big International crawlers give you smooth, high-torque, proven 6-cylinder diesel performance! You get 6-cylinder smoothness without "balancer" complications! For seconds-fast starting, lightning "load-follow" governing, and fuel-metering accuracy, compare proven International diesels!

See what it means in tough-job performance—and all-job bonus production—to arm your operators with proven International crawler advantages. See your International Construction Equipment Distributor for a demonstration!

FOR 50 YEARS...
Finest in the Field!
Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
• OMAHA, NEBR.
OMAHA
DRAGLINE BUCKETS

New Equipment . . .

Continued from page 49

unit are five rugged buckets, ranging in size from 1½ to 4 cubic yards. The manufacturer recommends that the weight of material to be carried in pounds per cubic yards be determined before a bucket is selected. The heavier the material, the smaller the bucket capacity that should be used.

For rapid loading, buckets tip back 40° at ground level. For additional stability while traveling, the buckets tip back at an angle of 45° when at carry height (14 inches above the ground).

Depending upon bucket size, dumping clearance under the bucket cutting edge ranges from 8 feet ½ inch to 9 feet 3 inches. Maximum dumping clearance under the hinge pin is 11 feet 6 inches. Reach from the front of the tires to the cutting edge ranges from 2 feet 6 inches to 3 feet 3 inches. Measured from the front of the frame, the reach is 4 inches greater.

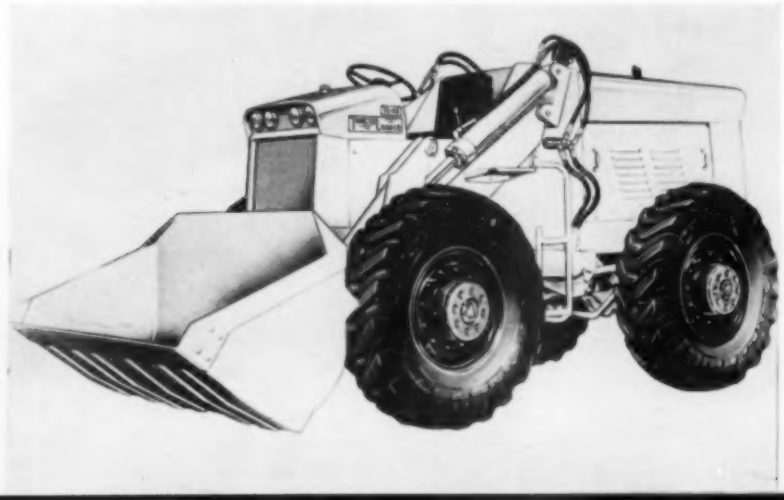
The TL-16 TractoLoader can be obtained with either a 109-hp Hercules gasoline engine, or a 104-hp Allis-Chalmers diesel engine. Top travel speed of the unit in either forward or reverse is 27 mph.

It is equipped with a single-stage 3.5 to 1 ratio torque converter, rear wheel power steering, 4-wheel power brakes that can be operated by either right or left foot, and a separate positive-locking mechanical parking brake.

The loader's completely enclosed hydraulic system incorporates full-flow magnetic, and full-flow wire mesh filters.

Specially designed for easier operation is the unit's automatic clutch cut-off. A touch of the brakes, and full engine power is delivered to the hydraulic system. Additional convenience is provided by an operator's seat that can be adjusted in six ways, bucket level indicator, rear axle disconnect and ignition key type starting.

The TL-16 TractoLoader is manufactured by Allis-Chalmers' Construction Machinery Div., and is sold and serviced by Allis-Chalmers construction machinery dealers.



Safety Hat

Manufacturer: Davis Emergency Equipment Co., Department EE, 45 Halleck St., Newark, N. J.

Claims: A new molded high impact plastic safety hat with adjustable all plastic suspension has been added to the Davis line of safety headwear. The new helmet is said to exceed the specifications of the federal government.

A new feature of the helmet includes a suspension that can be adjusted exactly to head sizes from 6⅝ to 7¾ inches. The suspension comes in two parts, both of which are replaceable, and a detachable sweatband which is also replaceable.

Unusual comfort is achieved with a headband that fits the back of the head snugly, preventing the hat from falling or blowing off. The hat is available in gray, white and yellow.

40-Ton CraneMobile

Manufacturer: Bay City Shovels, Inc., Department EE, Bay City, Mich.

Claims: Bay City has introduced a new 40-ton capacity CraneMobile designated model 610-T8440. The Bay City-built 8x4 carrier features removable outrigger beams and supports, durable-duty air brakes on all wheels, power steering, and variable speed transmission with 12 speeds forward and three reverse. Front axle clearance is over 13 inches.

Strongly reinforced equalizer beams and parallel torque rods equalize weight distribution, insure correct alignment, and withstand stresses. The complete machine can easily and quickly strip down to 17,270 pounds per rear axle and 13,120 pounds per front axle.

The interchangeable main boom and sections are designed to be equally adept at handling all types of loads from the standard 30-ft. boom length up to 150 feet of boom and jib.

The new CraneMobile can easily lift and walk with a 63,000-lb. load, and can handle 5,000 pounds over the rear on 150 feet of boom at 100-ft. radius. The large 71-in. tapered roller path provides smooth swing at 4.63 rpm. The upperworks features as additional standard equipment: foot throttle; precision load-lowering device; positive house lock; swing brake; independent boom hoist; telescopic boom backstops; collapsible Hi-gantry; automatic boom hoist clutch safety stop; and easily removable one-piece counterweight. The machine is convertible and may be used as crane, clamshell, dragline or pile driver.

Trench Drill

Manufacturer: Salem Tool Co., Department EE, Salem, Ohio.

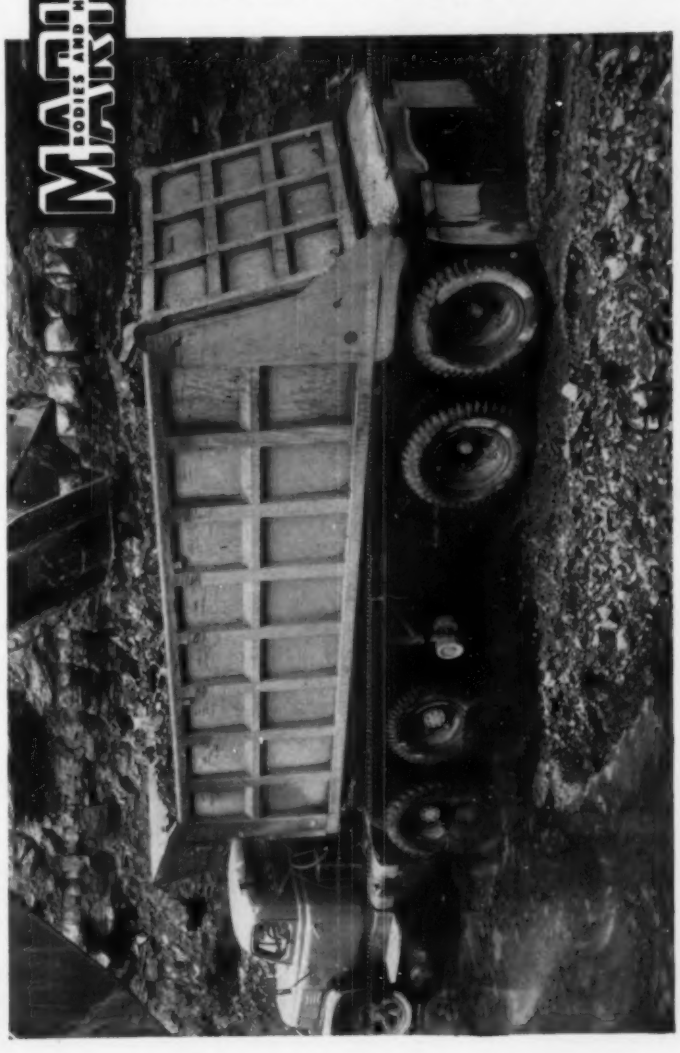
Claims: A new Salem trench drill is capable of drilling 400 feet and pushing pipe as far as 250 feet. The new model 24-TD is being used by contractors and utilities to install water, gas, electric and phone lines under streets, highways and railroads without cutting paving. The unit is also being used in dewatering jobs of all types.

The drill is powered by a 52-hp gaso-

Continued on page 56

NEWS ABOUT THE COAL HAULING BUSINESS

Marion Trailer Dumps Provide *Triple Pay-Off* For Saxton Coal Corporation



Here's how!

● **PAYLOAD BONUS . . .** This Indiana company put nine bigger (30 cu. yd.), lighter weight (with USS Cor-Ten steel) trailer dumps into operation, replacing nine 12-ton units . . . and hauling the same daily tonnage (2,000) of coal twice as far (from mine to tipple the distance is now 6 miles) at no increase in cost per ton mile.

● **PERFORMANCE BONUS . . .** These units have been in operation for two years, each making 9-10 round trips daily with an unusually small amount of downtime. (Marions are built to take it "under a shovel and under all hauling conditions.") A total of 7 other units of the same type have also been purchased for Saxton's operation. Big, rugged and fast front end telescopic hoists (model F-815-T-204) raise the bodies.

● **MAINTENANCE BONUS . . .** Marion engineering and manufacturing plus high strength steel provide long, maintenance-free life. Cor-Ten steel is highly resistant to atmospheric corrosion and has greater impact and fatigue strength.

Why not get complete information on Marion bodies and hoists. They're on-the-job designed with your profit in mind.

MARION METAL PRODUCTS CO.
Marion, Ohio

NOT in the Contract

Two cannibals were sitting around chatting amiably after a hearty meal.

"That was some meal," commented the first, licking his lips.

"Yes, my wife makes a wonderful soup," replied the host, "But I'm sure going to miss her!"

The big contractor in a southern state had bragged of the excellent honey served at one hotel where he and his new bride were to stop. At breakfast, he caught the waiter's sleeve and asked: "Rastus, where's my honey?"

"Dunno, boss, dunno. She done quit working here six months ago."

A gentle old lady on a suburban bus watched for some time, with the kindliest interest, a young soldier sitting next to her. The fellow was chewing gum vigorously. Finally, she leaned across and patted him on the knee and said, "I'm awfully sorry, but it simply isn't any use trying to talk to me, young man, I'm completely deaf!"

Organ recital: two women discussing their operations.

"I am sorry," said the dentist, "but you cannot have an appointment with me this afternoon. I have eighteen cavities to fill." And he picked up his golf bag and went out.

A salesman was explaining to his buddy the reason for his sudden affluence.

"I sell ladies stockings. Sometimes if the woman of the house is really interested, I put them on for her," he said.

"You must sell plenty that way," said the friend.

"No, not really," said the salesman. "My leg looks lousy in a woman's stocking."

"Sorry, Matthews. Your overtime pay hasn't come through yet."

Teen-age daughter (as rock-and-roll record finally comes to an end): "Man, did you ever hear anything like it?"

Father: "Only once when a truck full of live ducks hit a truck loaded with empty milk cans."

The middle-aged woman went to see her doctor.

"Well," he asked, "What's the trouble?"

"Doctor," she said, "it's backache, shooting pains in my legs and bilious attacks."

"How old are you?" asked the doctor.

"I shall be 32 on my next birthday, doctor," she replied.

"Hum," said the doctor, busy writing, "and loss of memory, too."

A Texan and a Kentuckian were arguing.

"Why we've got enough gold in Kentucky to build a gold fence six feet high around the whole state of Texas."

"You just do that, son," replied the Texan, "and if we like it—we'll buy it."

Two hep cats were taking calculus for the first time and while waiting for the instructor to arrive they took a quick look through the book. One of them came across the integral tables in the back of the book.

"Say, man," said one cat, "can you read that?"

"No, man," replied his friend, "but if I had my clarinet with me I could play it."

Groom: "So you didn't know I wore elevator shoes?"

Bride: "No. But I have a couple of surprises for you, too."

A man went to a physician, complaining of prolonged headaches. The doctor told him to stop smoking.

"I have never used tobacco in any form."

"Well, then, stop drinking."

"I am a total abstainer."

"Late hours, then, and fast women."

"I am always in bed by nine, I am a bachelor and live with my old maiden aunt. What else could cause my headaches?"

"I don't know," said the baffled doctor. "I guess your halo's pinching."

Plumber, arriving three hours after the call: "How's things, Mr. Brown?"

The happy Mr. Brown: "Not so bad. While we were waiting I taught the maid how to swim."

Special report to Caterpillar D8 Tractor owners:

CAT CATERPILLAR

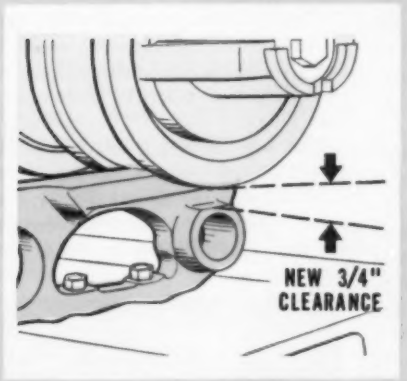
Parts you can trust
Dependable round-the-clock service

NEW TRACK COMPONENTS AVAILABLE FOR MOST D8 TRACTORS... GIVE UP TO 44% LONGER LIFE

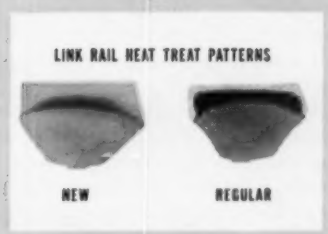
Caterpillar's continuous research and testing pay off for you with the development of superior D8 track components. The next time you replace track parts, specify these new components. They last longer and require less maintenance. Here's what's available for 2U, 13A, 14A and 15A tractors:

30% STRONGER PINS AND BUSHINGS have more wear area to extend life. The big track pins are ¼" larger in diameter and heat-treated deep to resist wear . . . pins will not bend and cause uneven wear. The large contact areas of the bushings are hardened deep, both inside and out. Under field conditions these bushings have lasted up to 44% longer than regular bushings.

• • •



STRONGER, LONGER, HIGHER TRACK LINKS are 3 lb. heavier, 1" longer and ¼" higher. New length means fewer track sections are required. Increased height gives up to ¼" more *link pin boss-roller flange* clearance. Improved steel used in these links permits 80% deeper rail hardening and greater strength —pins and bushings stay tight *in the links* even under the roughest application.



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NEW TRACK SHOE GROUSERS ARE 20% THICKER at the tip and are hardened much deeper than on regular shoes. The new shoe as a whole is bigger and heavier to resist bending, impact and wear. Track hardware used with the new track components is stronger—bolt diameter increased from ¾" to ⅞".

• • •

NEW DESIGN BORALLOY SPROCKET REPLACEMENT RIMS are available to accommodate the increased pitch of the longer links and bigger track bushings. Teeth are precision-machined to provide exact fit with track bushings—a major contribution to longer bushing life.

SEE YOUR CATERPILLAR DEALER for more information on extending your D8 track life. He has parts you can trust and round-the-clock service. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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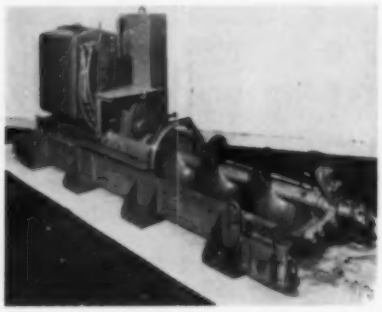
New Equipment . . .

Continued from page 53

line motor. It has a four-speed transmission; electric starting; forward thrust of 30,000 pounds; and maximum torque at the auger of 6,500 foot-



pounds. It is equipped with variable hydraulic feed in a rigid frame for drilling accuracy. A pipe pusher and one guide are standard equipment.

SyncroTouch Transmission Control

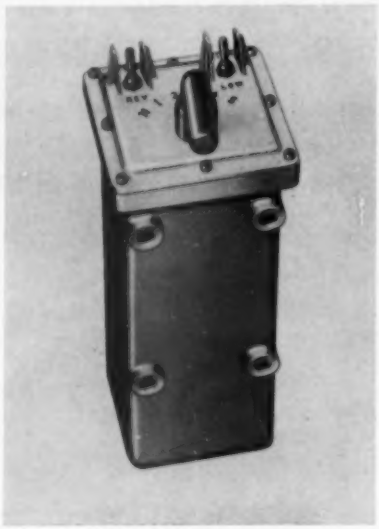
Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: Effortless, finger-tip shifting of Caterpillar DW20 and DW21 tractors is provided by the SynchroTouch transmission control, which has been introduced as optional equipment by Caterpillar. Manual shift transmissions will continue to be available for the tractors.

A prime advantage of the new transmission control is its feature of permitting operators to shift up or down instantly, by merely dialing a desired gear range. Eliminated is the necessity of performing the usual gear-shifting operations required by standard direct drive transmissions.

As a result, shifting time is reduced from a multi-second to a fractional-second interval, with the added benefit of effortlessness.

The SynchroTouch is controlled by a gear selector, located to the right of the operator at arm level. The selector is mounted on top of the control box, and replaces the gear shift lever. The standard clutch foot pedal is retained, but used only when the machine is started from a standstill.



The SynchroTouch transmission control facilitates maximum machine production by permitting the operator to perform quick shifts when encountering changing grade and terrain conditions. This precludes any tendency to stay in an improper gear range rather than shift up or down to match conditions. Because of this ability to perform easy, instantaneous gear changes, faster cycle times will result. In addition, the operator is able to maintain high performance over a complete working shift, because of reduced fatigue.

The direct drive transmission of the DW20 and DW21 is not changed. The only changes occur in the shifter shafts, forks, shaft brackets, transmission covers and shifting linkage. These components are replaced by the SynchroTouch shifting device. With the SynchroTouch in place, the shifter shafts become pistons housed in hydraulic cylinders. Hydraulic pressure is supplied by a vane-type pump mounted at the rear of the engine, driven by the timing gear train. Action of the hydraulic system is controlled electrically, actuated by the operator's selector switch.

In normal operation, full gear-changing action takes place in a fraction of a second. The operator dials the gear selected, which disengages the master clutch by air pressure. After clutch disengagement, the shifting collar is hydraulically disengaged, putting the transmisison in neutral.

If the operator is up-shifting, the shifting collars are automatically brought to approximately the same rpm, and hydraulically shifted into place to accomplish the gear-range change. Air is then exhausted from the clutch roto-chamber, permitting the clutch to re-engage.

When down-shifting, the governor control reduces the rack to the low-idle position, creating a momentary reversal of power through the transmission, during which time the down-shift takes place.

The foot-operated clutch pedal is used only when shifting from neutral to a gear range from a standstill. This safety feature precludes the possibility of operators setting the machine in motion by inadvertently manipulating the gear selector.

Diesel-Powered Roller

Manufacturer: Bros, Inc., Road Machinery Div., Department EE, 1057 Tenth Ave., S.E., Minneapolis 14, Minn.

Claims: A new diesel-powered model of its recently introduced model SP-54B 10-ton-capacity rubber-tired, self-propelled roller has been announced by Bros.

The new SP-54B-D features a Hercules DD-226 four-cylinder diesel power unit which develops 65 hp at 2,000 rpm. Equipped with a torque converter, the self-propelled roller travels at speeds up to 20 mph.

Other features of the new model, also incorporated in the gasoline-powered SP-54B, include lower center of gravity for greater stability; improved power steering, reversing clutch, and transmission; brakes on all four drive wheels; larger brake drums; and parking brake connected directly to drive shaft for added safety.

Each wheel is equipped with a plastic scraper for asphalt or sealcoating compaction work. A hook-on hood over the

final drive assembly requires only five seconds to remove.

Skid-Shovel

Manufacturer: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Claims: The International Drott 4-in-1 Skid-Shovel—an extra rugged front-end loader which duplicates the actions of four specialized machines—has been adapted for use with the new T-340 crawler tractor introduced by International.

Hydraulically adjustable, the segmented-type bucket can serve as a standard bucket, bulldozer, carry-type scraper and clamshell. Selection of the desired machine action is made from the tractor seat by means of the machine selector lever, and changeover from one tool to another takes only seconds.

Skid-Shoes mounted beneath the bucket serve as a fulcrum for strong pryout action. This gives the 4-in-1 ability to work in tough or frozen soil as well as being able to pry out stumps, boulders, old foundations, concrete pavement and other heavy and deeply imbedded materials which the sheer lifting force of ordinary buckets is not great enough to handle.

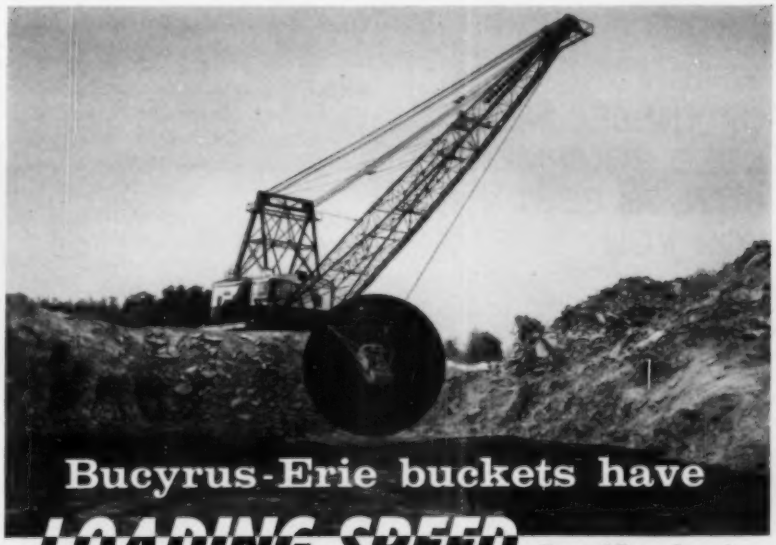
With a capacity of ⅝ cubic yards struck and ⅞ cubic yards heaped, the bucket dumps in two ways. It can dump in the conventional roll-forward action, or through the bottom by lifting the front half of the bucket and letting the material fall through.

As a loader, the 4-in-1 is designed for tough digging and for prying out deeply imbedded materials. As a carry-type scraper, it can be used for stripping topsoil, sod, gravel or unusually sticky materials. When set as a clamshell, the 4-in-1 "surrounds" loose material, picking it up cleanly without "chasing" it. The front half or "lip" of the unit is raised all the way to form an efficient bulldozer.

Maximum roll-back of the 4-in-1 at ground level is 45°.

The new International T-340 is a 31

Continued on page 58



Bucyrus-Erie buckets have

LOADING SPEED built in!

In high-speed Bucyrus-Erie buckets, weight is concentrated to help teeth, cutting edge, and thin "slicing action" lip penetrate swiftly. Material flows in easily because the bucket is tapered properly.

Bucyrus-Erie buckets swing smoothly through the carry without bobbing and spilling because they're properly flared and balanced. The high arch and smooth inside design assure clean, fast dumping.

For better bucket production, see your Bucyrus-Erie distributor or representative, or write Bucyrus-Erie Company, South Milwaukee, Wis., Dept. 4R.

BUCYRUS ERIE®

BUILDS BETTER EQUIPMENT

WHICH OF THESE 3 USED EQUIPMENT BUYS IS BEST FOR YOU?

Only your Caterpillar Dealer offers you these three protected buys on used equipment. Which is best? That depends on how you want to use a unit and what you want to pay. Whatever you want, you'll find it in his lot.

1 **A "BONDED BUY"** on used Cat-built equipment is your safest buy. A bonded guarantee, up to $10,000, of satisfactory performance on *all* parts is given when you purchase a "Bonded Buy" used Cat-built machine.

2 **A "CERTIFIED BUY"** covers units of any make in good condition. This type of protection carries your dealer's written guarantee of satisfactory performance.

3 **A "BUY AND TRY"** deal is just what its name implies. This protects you with your dealer's written money-back agreement.

You *know* what you're buying from your Caterpillar Dealer. You'll find him listed in the Yellow Pages. Visit his Used Equipment headquarters for the best buys in the market!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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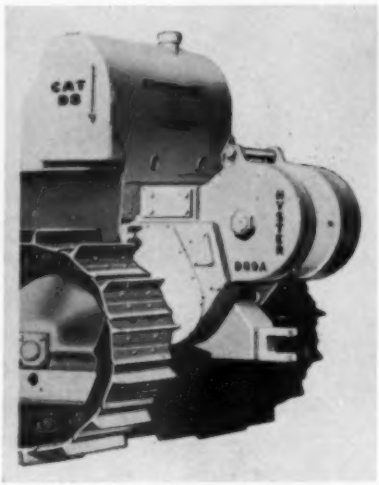
BEST BUYS IN NEW AND USED EQUIPMENT

New Equipment . . .

Continued from page 57

drawbar horsepower crawler powered by a four-cylinder gasoline engine with 135-cu. in. displacement. Weighing 6,500 pounds, the tractor has five speeds forward, one in reverse and a speed range of 1.5 to 1.9 mph., with 66 inches of track on the ground.

Towing Winch



Manufacturer: Hyster Co., Department EE, 2902 N.E. Clackamas St., Portland 8, Ore.

Claims: A new towing winch for installation on the new Caterpillar D8 and D9 tractors with direct or torque converter drive has been introduced by Hyster.

Designated the Hyster D89A, the new towing winch embodies four significant design improvements. They are:

1. Simplified gearing—the D89A design incorporates only nine gears and 13 bearings. All gears are cut from special steel and are heat treated for long service life. Anti-friction bearings are used throughout. The drum is direct gear driven with constant-mesh transmission for smooth shifting.

2. High-speed reverse—speed of 218 feet per minute on bare drum and 348 feet per minute on full drum reduces time required to pull out cable.

3. Easier-to-operate controls—simple, rod-type control levers mount to the right of the tractor seat for operator convenience.

4. New jaw clutch engagement spring—makes shifting of dental clutches faster and easier.

5. New differential brake requires only one adjustment in life of the brake lining.

In addition to the new Series H Cat D8 tractor, installation can also be made on prior D8's through models with serial numbers beginning with 14A and 15A, and on all D9 tractors.

Water Wagon

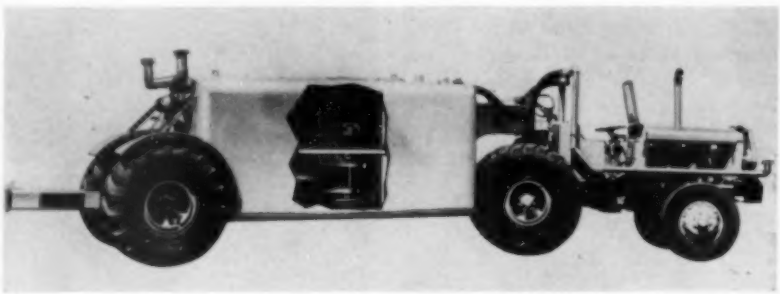
Manufacturer: Koehring California Div., Department EE, Koehring Co., P. O. Box 1891, Stockton 4, Calif.

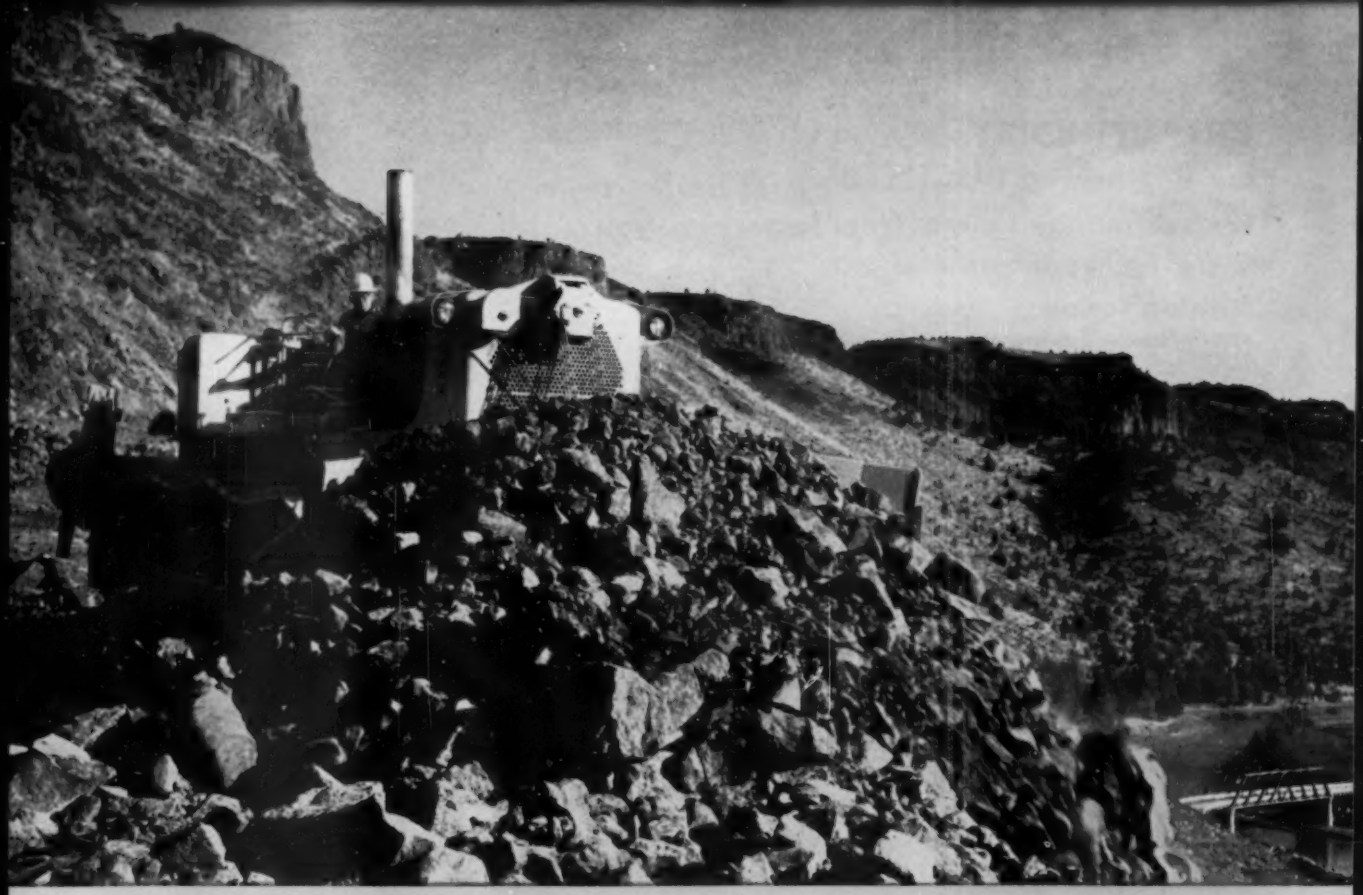
Claims: An advanced design powered water-wagon, known as the Clark Water-Cator is now in production at Koehring California. Used primarily for the application of compaction water in highway and street construction, the Water-Cator also becomes an efficient transport unit when desired. It is offered in two sizes. Model 300 has a 3,000-gallon capacity, and model 580 can handle 5,800 gallons.

Both models are self contained, portable units which are adaptable to fit any make truck of sufficient power. A hydraulically driven pump, a self cooling feature, is submerged directly in the tank itself which eliminates outside engines and unnecessary piping.

The tank can be fitted with either two or four adjustable spray heads, incorporating positive shut-off plus direction and volume control. Water flow is controlled by starting and stopping pump with control valve in the truck cab. This provides for fast unloading due to ample pump capacity for good spray pressure.

Weight distribution is basically the same as on any standard wagon or scraper.





TAKE-CHARGE D9

—ONE BIG REASON KEYSTONE MET AND EXCEEDED PRODUCTION SCHEDULES!

This giant Cat D9 Tractor with No. 9S Bulldozer and No. 9 Ripper is working on the Prineville Dam—Crooked River Project about 20 miles S.E. of Prineville, Oregon. Here it is busy on the side-hill excavation of a 3,000-foot-long access road. Says Project Manager Art Chinn of the Keystone Construction Co. Inc. & Associates: "We are meeting and exceeding expected production schedules. Our D9 was bought primarily to pushload DW21s, but we also find it a high producer on other jobs."

That's the key to this take-charge giant's value—high production. Whether 'dozing, ripping or pushloading, the D9 has the capacity to handle *more* work with *less* down time at *lower* operating cost than any other earthmover. Many features contribute to its ability to get a lot of work done fast day after day. Here are just a few:

Power steering and power brakes provide fast, positive response and ease of operation that help an operator maintain production anywhere.

Exclusive oil clutch provides up to 2,000 hours of service without adjustment—equal to about 12 months' "adjustment-free" operation.

Dry-type air cleaner removes 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Cuts maintenance time and costs.

Lifetime lubricated rollers and idlers never require further lubrication until time for rebuilding.

For your big jobs, you can't beat a D9. And you can't beat the backing you get from your Caterpillar Dealer. He's ready round-the-clock to help you meet and whip production schedules with prompt service. See him for complete information about the D9, available with direct drive or torque converter. Ask him to demonstrate this giant on your job.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

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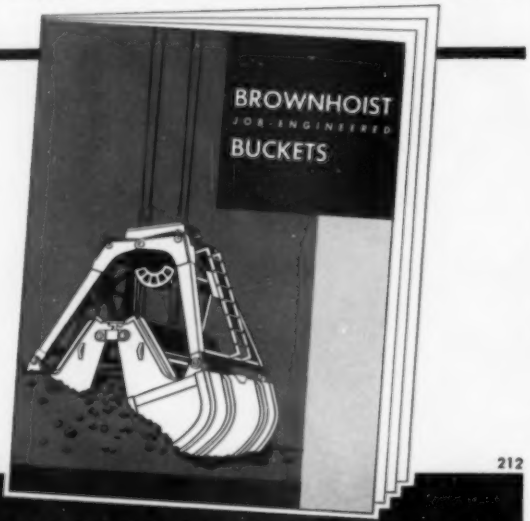
BOOST PRODUCTION WITH A TAKE-CHARGE D9

get the facts on
BROWNHOIST
job-engineered **BUCKETS**
for less money · direct from factory-to-you
write for your copy of this 24-page illustrated catalog today

Capacities from ½ cu. yd. to 400 cu. ft.



write to:

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INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY · MICHIGAN

New Trade Literature

Subject: **Coal Pit Equipment**
Content: *Modern Methods and Equipment for Coal Operations* is the title of a 12-page catalog which shows the use of International crawler tractors in such stripping operations as high-walling, backleveling and benching. Also shown are examples of work done by International Payhauler units and International bottom-dump coal haulers in moving large quantities of coal, rock and overburden. Ask for catalog CR-664-I.
Where to get: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Submersible Electric Pump**
Content: The Flygt B-80L heavy-duty submersible electric pump is detailed in a four-page folder. The pump has a capacity of 300 gpm against a head of 25 feet or 70 gpm at 150 feet. It weighs only 175 pounds. It can run for long periods without supervision. Other outstanding features of the Flygt pump include its ability to handle highly abrasive material and to run dry without damage. The B-80L is ideal for use in mines, quarries and on construction and drainage work of all kinds.
Where to get: Stenberg Mfg. Co., Department EE, Hoosick Falls, N. Y.

Subject: **Steel Piles**
Content: A comprehensive 24-page catalog covers Monotube fluted steel foundation piles. In addition to complete descriptive information, the catalog includes typical installation photos, test driving data and other technical information of particular interest to engineers, contractors and architects. Ask for catalog No. 91.
Where to get: Union Metal Mfg. Co., Department EE, Canton 5, Ohio.

Subject: **TC-12 Tractor**
Content: A new Euclid 24-page catalog discusses the model TC-12 Twin Power crawler tractor. The 4-color booklet is illustrated with photographs from various types of operations, cutaway and sectional views, and drawings that explain Twin Power application, Torqmatic Drive, hydraulic track tensioning and other design features of the tractor. The catalog contains condensed specifications and a performance chart in addition to data on attachments that are available for use with single and double cable control units. Ask for form No. 606.
Where to get: Euclid Div., Department EE, General Motors Corp., Cleveland, 17, Ohio.

Subject: **Tractor Scraper**
Content: Production advantages of the new Caterpillar DW21 series G tractor and No. 470 series B scraper are outlined in *Out Front For '59*. The 8-page booklet describes new features of the combination, which include a boost to 345 hp from 320 on the former model; a 99.8% efficient dry type air cleaner; and increased scraper capacity of 19.5 yards struck and 27 yards heaped. Scraper features discussed are a higher apron lift, a push block assembly designed to meet the stresses of modern-day tandem pushing and a stronger bowl, draft frame and apron. Scope of the new unit's on-the-job testing program is indicated by the number of photos showing the machines being worked under widely varying soil and climatic conditions. Ask for form D915.
Where to get: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Subject: **Highway Officials Directory**
Content: More than 1,700 names, titles and addresses of administrative engineers and officials in the 50 state highway departments, the District of Columbia and Puerto Rico are listed in the 1959 edition of the convenient, pocket-sized directory, *Highway Officials and Engineers*, published by the American Road Builders' Assn. The directory also lists administrative personnel of the Bureau of Public Roads, including the heads of its regional offices and the division offices in each state; engineers and administrative personnel of toll road authorities; and officers and directors of ARBA, its eight organized divisions, and its Washington headquarters staff. Price is $1.
Where to get: American Road Builders' Assn., Department EE, World Center Building, Washington 6, D. C.

NEED TO MOVE 3,000 YDS. PER SHIFT?

Whether your job is in construction or stripping as shown in this California operation, this big diesel Marion 111-M can make the dirt fly.

Here, its 3½ yard bucket on a 90-foot boom has chewed and moved 3,000 yards in an 8-hour shift.

Electric swing on this diesel-powered Marion, plus long wide crawlers that let it travel and work on any normal footing, make it ideal for many different types of work.

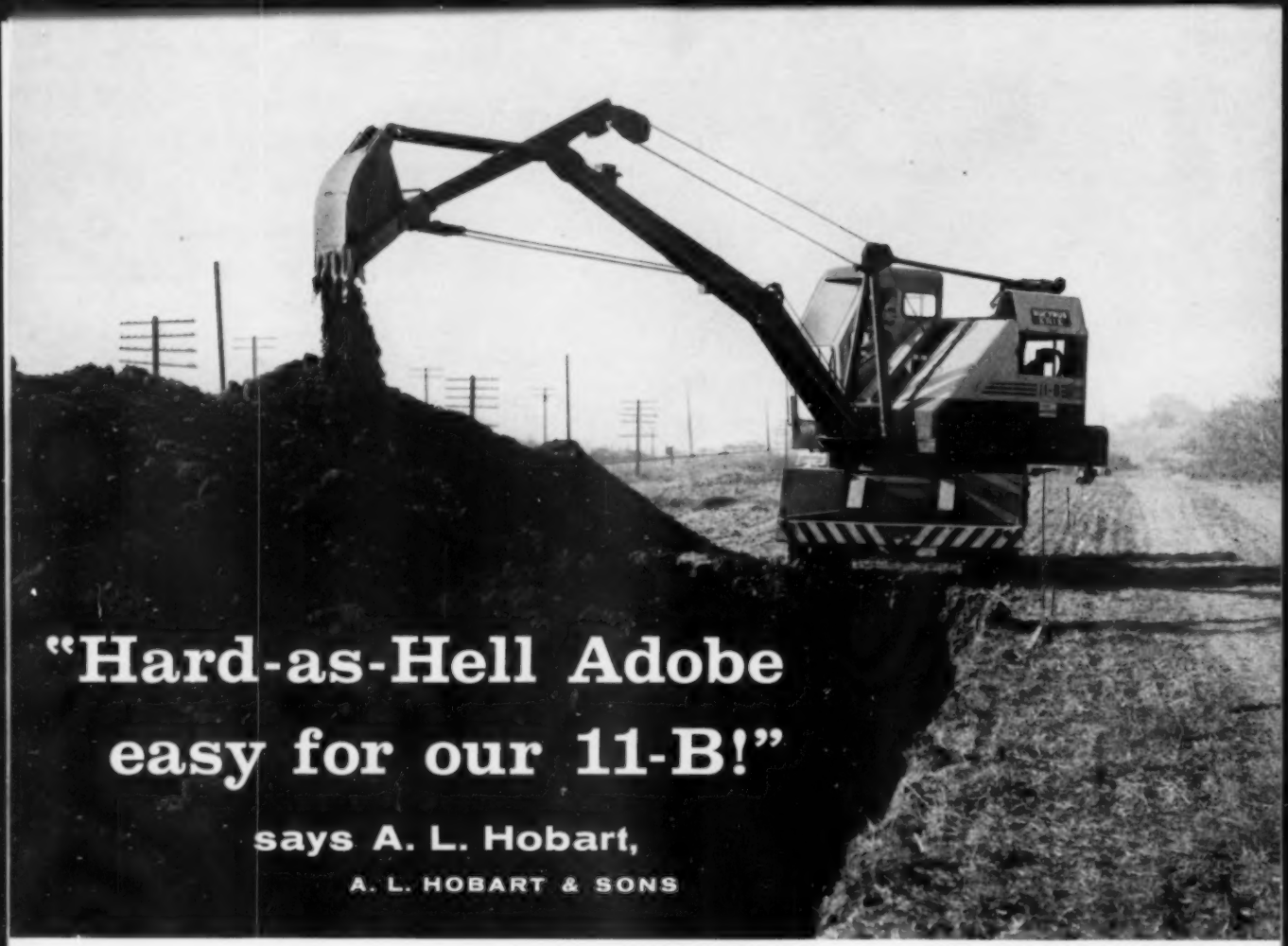
Ask your Marion Distributor for a 24-page catalog on this versatile, dependable machine.

You get

MORE *with* **MARION**

MARION POWER SHOVEL COMPANY - MARION, OHIO, U.S.A.

A Division of Universal Marion Corporation



"Hard-as-Hell Adobe easy for our 11-B!"

says A. L. Hobart,

A. L. HOBART & SONS

Hobart averaged 200 lineal feet of 12-ft-deep, 5½-ft-wide trench every 8-hr shift on this pipeline relocation job near Walnut, California, digging in "hard-as-hell adobe!"

Hobart's reaction to the new Bucyrus-Erie 11-B is typical, and here are more reasons why:

The 11-B hoe has the extra range owners have needed so long — digs 17 feet down . . . reaches out 26 feet, 9 inches to put dirt farther away from the trench, loads trucks easily, makes fewer moves per day.

The 11-B's exclusive, variable pitch dipper action gives you as much as 10% more level floor, changes the pitch of the dipper continually as you dig.

Easy to maintain? The 11-B has more time- and energy-saving maintenance features than any other crane in its class, including a color-guide lube system, automatic gear lubrication, pre-lubricated ball bearing swing circle with nothing to adjust, no bushings to replace.

Get the complete 11-B story from your distributor, or write Bucyrus-Erie Company, South Milwaukee, Wisconsin, Dept. 22-E59.

BUCYRUS ERIE®

Builds Better Equipment

Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has acquired the Tractomotive Corp., Deerfield, Ill., through an exchange of stock. One of Tractomotive's principal product lines is a rubber-tired wheel loader called the Tractoloader, which is sold through Allis-Chalmers construction machinery dealers. The Illinois firm also manufactures front-end shovels, rippers, side-booms for pipelaying and log loading equipment for attachment to crawler tractors. Since 1945 when Tractomotive was founded, it has been a major supplier of this equipment to Allis-Chalmers. Tractomotive will become a part of the Allis-Chalmers construction machinery division.

American Cyanamid Co., New York, N. Y., has named Stuart A. Currie as contractor service manager of its explosives and mining chemicals department. Formerly district manager of the Pennslyvania-Maryland area, Currie will be responsible for nationwide coordination of marketing to the construction industry. His headquarters will be in Latrobe, Pa. He joined the technical section of Cyanamid's explosives department in 1937. In this capacity, he supervised blasting in mines, quarries, coal stripping operations and construction projects.

Bucyrus-Erie Co., Richmond, Ind., has appointed Gill Drilling Equipment Co., Inc., North Branford, Conn., as a distributor for the B-E line of blast hole drills, parts and drilling and fishing tools. The new distributor's territory includes the District of Columbia and the entire state of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New Jersey and Delaware. Also included are portions of the states of New York, Pennsylvania,

Continued on page 66

LET YOUR CRANE EARN ALL THE **PROFIT** IT CAN

SELECT

WILLIAMS BUCKETS

BUILT TO DIG

Quality clamshell and dragline buckets for every application

CONTACT YOUR WILLIAMS DEALER

Williams Bucket Div., The Wellman Engineering Co., 7000 Central Ave., Cleveland 4, Ohio, U. S. A. Branches, New York, 420 Lexington Ave., Chicago, 520 North Michigan Ave., Birmingham, Alabama, 2805½ Cahaba Rd.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters is all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

HEAVY EXCAVATION EQUIPMENT

Shovels—Cranes—Drills—Trucks

15-W Bucyrus-Erie Elec. Drag, 215', 13 yd.
9-W Bucyrus-Erie Elec. Drag, 160', 11½ yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 160', 9 yd.
360-M Marion Elec. Drag, 175', 8 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus-Erie Diesel Drag, 125', 6 yd.
5-W Bucyrus-Erie Diesel Drag, 100', 6 yd.
2400 Lima Dragline, 130', 5 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5 yd.
3900, 3500 and 3000 Manitowoc Cranes
111-M Marion Drag, 100', 4 yd.
1601 Lima 4 yd. Shovel/Drag
1055 P&H Drag, 80', 3½ yd.
1201 Lima Dragline, 85', 3 yd.
54-B Bucyrus-Erie Drag, 80', 2½ yd.
5560 Marion 26 yard Elec. Shovel
750-B Bucyrus-Erie 20 yd. Elec. Shovel
1050-B Bucyrus-Erie 20 yd. Elec. Shovel
5480 Marion 18 yd. Elec. H. L. Shovel
151-M Marion 7 yd. Elec. Shovel
170-B Bucyrus-Erie 6½ yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
120-B Bucyrus-Erie 4 yd. Elec. Shovel
111-M Marion 4 yd. Standard Shovel
54-B Bucyrus-Erie 2½ yd. Standard Shovel
Large selection of smaller shovels and draglines available
Model T-750 Reich Truck-Mounted Rotary and Down-the-Hole Drill
Euclid Trucks—Rear and Bottom Dump
Truck Cranes, Dozers, Scrapers, Front End Loaders, Drills, Buckets, Attachments and other miscellaneous equipment available.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Used 5-W diesel walking dragline, 105' boom, 6-yd. Hendrix bucket, reported in good operating condition, price subject to purchaser's inspection $85,000, f.o.b. cars located in Southeast.

EXCAVATING ENGINEER
Box 3748
South Milwaukee, Wis.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1 Northwest 80-D shovel and dragline.
2 Northwest No. 8 draglines.
1 Marion 151-M 6-yd. shovel.
1 Marion 4161 dragline equipped with 120' boom and 5-yd. drag bucket.

EXCAVATING ENGINEER
Box 3744
South Milwaukee, Wis.

Bucyrus-Erie model 15-B, serial #77267, combination backhoe and shovel with Buda gasoline engine. Good condition. $8,000.
Bucyrus-Erie model 22-B, serial #79795, combination ¾-yd. shovel and crane, 60' boom with pendant suspension, Caterpillar D318 diesel engine. Machine available as is or rebuilt.
Insley crawler mounted backhoe, type "K", 24" bucket, standard crawlers, serial #6923, Waukesha gas engine, year 1955. Excellent value. $7,850.
Lorain model L40, serial #15639, combination shovel, backhoe, 50' crane boom with fairlead and rudomatic tagline. Fair condition. $5,000.
Bucyrus-Erie Hydrohoe attachment for H-3 Hydrocrane complete with 18" general purpose dipper, 20" utility dipper and all necessary fittings. Very good condition. $1,000.

BINDER MACHINERY CO.
Brighton St. Union, N. J.
MUrdock 8-0060

7—P&H model 955 diesel draglines with Waukesha 6 WAKD engine, 70-ft. boom, crawler mounting 18'3" long overall, 12'8" wide overall, 42" wide treads, 5 to 7 years old, location western Pennsylvania. Inspection gladly arranged.

EXCAVATING ENGINEER
Box 3747
South Milwaukee, Wis.

SCRAPERS

Six Euclid S-18 tractor-scrapers, Allison 3-speed torqmatic drive with model 28 SH 21-yd. heaped scrapers, 4—27:00x33—30 ply tubeless tires. Good operating condition, $29,000 each.
Six Caterpillar DW20 tractors with Cat No. 20 scrapers. 20-yd. heaped capacity. Good operating condition, $25,000 each.

SHOVELS

Northwest model 80-D, 2½-yd. shovel with 30" tracks, 25' boom, 22'6" dipper stick, powered by a Murphy diesel engine. Reconditioned. $42,500.
Link-Belt Speeder, model LS85, ¾-yd. capacity, 50' boom, 2 sheave boom point, 20" pads, powered by Cat D-318 diesel engine. Subject to inspection. $5,500.

SHOVEL ATTACHMENTS

Bucyrus-Erie tunnel shovel attachment for a 22-B consisting of 14' boom, 12'10" stick, 1-yd. rock dipper, crowd drum, sprocket and crowd chain. Excellent condition. $3,500.
Erie ½-yd. general purpose clamshell bucket with teeth. Good condition. $750.

TRUCK CRANES

Michigan T6K truck crane, Hercules gas engine, 28' boom, tagline, 6—11:00x20 tires. Good operating condition. $6,500.
Lima Paymaster truck crane, model E34, ¾-yd. 35' boom, 6-cylinder Buda gas engine, Mack 6x6 truck carrier with 10—12:00x24 tires. As inspected. $12,000.
Subject to inspection & prior sale.

H. O. PENN MACHINERY CO., INC.
140th St. & East River CYpress 2-4800
New York 54, N. Y.

1—Bucyrus-Erie model 75-B electric powered shovel equipped with 2½-yd. manganese dipper. Supply of spare parts also available. Weight 225,000 lbs.

EXCAVATING ENGINEER
Box 3746
South Milwaukee, Wis.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

⅜-yd. model H-3 Bucyrus-Erie Hydrocrane (1950) mounted on IHC A-162 truck chassis equipped with tagline reel, clam bucket.
½-yd. model H-3 Bucyrus-Erie Hydrocrane (1953) mounted on 1953 Ford F-600 truck chassis, complete with 2-piece telescopic boom, tandem outriggers, operator's cab with heater, tagline reel, hydraulic clamshell bucket. Overhauled and repainted. In excellent condition.
½-yd. model 514 Unit hoe, Chrysler gas engine and ½-yd. dipper. $4,500.
¾-yd. model 375 American crawler shovel with Waukesha gas power. New 1949. Priced at $3,750.
¾-yd. model 22-B Bucyrus-Erie crawler shovel dragline, equipped with Cat D318 diesel engine, 12" standard crawlers, 40' boom, fairlead. In good condition.
¾-yd. model 375 American crawler-mounted dragline, long crawlers, fairlead. Series 3-71 GMC diesel engine.
¾-yd. model 34 Lima crawler mounted shovel (1953) Cat D318 diesel power. Good condition.
¾-yd. model 25 Northwest shovel-dragline crawler mounted machine—Cat diesel engine. Good condition.
¾-yd. model 34 Lima crawler mounted crane-dragline-hoe combination, Buda gas power. Very good condition.
1-yd. model 455 P&H crawler crane-clam-dragline machine with 75' boom, 15' jib; Chrysler 8-cylinder gas engine. In excellent condition. F.O.B. Milwaukee.
1½-yd. model 604 Lima crane-dragline machine, new in 1951, with Cummins diesel engine, 80' boom and fairlead. Overhauled and repainted. In very good condition.
2-yd. model 820 Lorain crane-clam-dragline equipped w/Cat D13000 diesel, swamp cats, 90' flange-type boom, fairlead, tagline reel, pressure lubrication system. In excellent condition.
15-ton Bay City truck crane in good condition. Priced to sell. Unit should be seen to be appreciated.
35-ton model 30-B Bucyrus-Erie transit crane demonstrator. Save $20,000. Equipped with 130' boom, GMC diesel 4-71 on crane, Waukesha gas power on carrier. New machine warranty.
Gradall multi-purpose machine model M2460 with GM diesel engine; mounted on 6x4 carrier having 4-wheel tandem drive; equipped with 36" heavy duty bucket and single tooth heavy duty ripper—new 1957. Good buy at $17,500.
Gradall model 2400 powered with IHC 4-cylinder gas engine, mounted on IHC RF 190 tandem rear axle truck equipped with standard boom 36" digging bucket, 24" digging bucket with ESCO teeth. Priced at $8,500.

J. P. WAITE, INC.
3304 W. Pierce St. P. O. Box 313
Milwaukee 1, Wis. EV 4-1900

71-B Bucyrus-Erie shovel, 42" tracks and Kohler light plant. Tracks and running gear 60 to 70% good. Upper works in good condition. Engine, torque converter and clutch completely rebuilt in October 1958. Excellent operating condition. F.O.B. railroad car. $60,000.

WESTMONT TRACTOR CO.
Box 1445
Missoula, Mont.

For Sale—Lorain 107 hoe, w/shovel front, 45-ft. crane boom, clamshell & cement buck. New in 1955. Excellent condition. Owner operated. $6,000.

PERRY LEGG & SONS, INC.
Tannersville, N. Y.
Phone: Haines Falls 675

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—Michigan C-16, ½-yd. hoe, ½-yd. 22" dipper, 9'9" crawlers, 20" wide, Hercules gas engine JXD #1742230, machine #3797, 4 years old.
1—Koehring 303, ¾-yd. hoe, 30" dipper, 10'6" crawlers, 24" wide, Waukesha gas engine #484150, 4⅝"x5¼", serial #2337.
1—Worthington 16-S concrete mixer on 4 pneumatic tires with power skip and water tank, serial #5548 powered by Wisconsin VF-4 gas engine, 4 years old.
1—Osgood 200, ½-yd. hoe with 22" dipper, 11' crawlers, 22" wide, powered by Continental gas engine, machine #6285, 5 years old.
1—International TD-14 crawler loader model 14K3 with Drott skid shovel, 2½-yd., serial #B-2463, only 1½ years old, excellent shape, 1,500 hours.
1—Bucyrus-Erie 15-B hoe attachment with ½-yd. dipper, 34" wide with side cutter straight boom—like new.
1—Bucyrus-Erie 15-B ½-yd. shovel attachment—perfect.
1—Wiley PM215 Patchmobile portable asphalt patching unit on two pneumatic tires, complete with rotary dryer. This unit is new.
1—Ruhr M-1, ½-yd. heavy duty grapple, new, excellent buy.
1—Wayne 36" rider industrial vacuum pick-up power sweeper, demonstrator, 2 years old.
1—LeRoi 315 air compressor on 4 pneumatic tires, 7 or 8 years old.
2—CMC Jetcretes with all accessories. Excellent condition, practically new with all extra accessories.
1—Baker 3,300 gallon bulk tank trailer, single axle.
1—Ross 6-ton pneumatic tires fork lift truck, 10' mast, 14' lift.
1—Bucyrus-Erie 15-B positive crowd shovel, 15'6" boom, 12'6" handle, ½-yd. cast iron dipper including dragline and clamshell equipment consisting of 30' boom, complete dragline equipment, also tagline equipment with rope, closing and lower ropes, drum lagging, no clamshell bucket or drag bucket included. Fully enclosed steel cab, independent power boom hoist, 20" wide treads, Buda 6-cylinder 3⅛"x4¾" HP-326 gasoline engine with electric starter. 2,900# cast iron ballast, serial #51572.
1—Used Kennedy Van-Saun revolving scrubber washer screen, 48" diam. x 21'0" long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.
1—Insley type L, ¾-yd. hoe, GM series 3-71 diesel engine, serial #7009. Good working condition.
1—Bucyrus-Erie 20-B ¾-yd. positive crowd shovel, powered by 40 HP electric motor.
1—Bucyrus-Erie 22-B ¾-yd. hoe, serial #67118, powered by GMC 3-71 diesel engine, standard cats, machine in good condition.

S. M. CHRISTHILF & SON, INC.
Timonium Road & Harrisburg Expressway
Timonium, Md.

1—Bucyrus-Erie 22-B S/N 37382 dragshovel Cat D315.
1—Bucyrus-Erie 19-B S/N 13241 dragline Chrysler 8.
1—Bucyrus-Erie 15-B S/N 109496 dragshovel Cat D315.
1—American 345 S/N GS 271 shovel GM 3-71.
1—American 345 S/N GS 731 shovel & dragshovel GM 3-71.
1—Insley K12 S/N 1494 shovel & dragline Buda.
1—Link-Belt LS50, S/N 5D463 dragshovel Buda.
1—Lima 44 S/N 330537 dragline 80' Cat D318 3rd drum, tagline, air controls.

Call or Write
THE ZECO CO.
2929 University Ave. S.E.
Minneapolis 14, Minn. FRanklin 1-7971

Model 15-B Bucyrus-Erie shovel—new surplus. Serial No. 33304. Less cab—with Chrysler industrial engine. $6,500.
Model LS-51 Link-Belt dragshovel w/Waukesha gasoline engine. Warranty machine. $8,500.
Austin-Western super 99 6-wheel drive and steer motor grader w/GMC 4-71 diesel w/torque converter, cab, scarifier. Demonstrator—guaranteed. $18,000.
Model DE-30 McKiernan-Terry diesel hammer w/Universal drive cap. $12,000.
Symons 22" cone crusher w/35 hp motor and drive and complete lubrication system; extra mantle and cone. $7,950.

THE W. T. WALSH EQUIPMENT CO.
12750 Berea Road
Cleveland 11, Ohio CLearwater 2-4660

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 51-B
New Track Rollers

½ Price

Aggregate Equipment & Supply Co.
811 Lehmann Bldg. Peoria, Ill.

Bucyrus-Erie crowd shovel attachment for model 15-B ½-yd. excavator. Very good condition. U-197.
Bucyrus-Erie 15-B ½-yd. hoe. Cat diesel D315 has electric starter. Been through our shop and in excellent condition. Has grouser type pads. U-339. $14,000.
Dragline bucket for Bucyrus-Erie 15-B. ½-yd. capacity. Good condition. U-142. $300.
Hanson model 31 crawler backhoe. International UD-6 diesel engine. Has shovel and crane attachments with no extra cost. A bargain. U-32. $3,400.
Northwest crowd shovel attachment for model 25, ¾-yd. New and unused. U-198.
Link-Belt Speeder model LS-52 crowd shovel. Powered by Cat D315 diesel. Very good condition. U-276. $10,750.
Wellman 2½-yd. dragline bucket, model DXL, S/N D-1789. Has never been used. $1,200.
Call, wire or write today for information about these and our many other items of used equipment.

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 Salt Lake City, Utah
Phone: DAvis 2-1241 TWX No. SU-278

Model 25 Northwest hoe, serial No. 9835. With Caterpillar diesel engine.
Model 25 Northwest diesel shovel and pull shovel, GMC diesel engine. Serial No. 7723. Located in Seattle.
Model L-41 Lorain hoe with Waukesha gas engine. Serial No. 17832.
Used 38-B straight boom hoe attachment. Excellent condition.

CLYDE EQUIPMENT CO.
3410 First Ave. So.
Seattle 4, Wash.

Bids will be accepted on Osgood dragline, ¾-yd. model 600, Ser. #3101, w/Cat D8800 power unit, Ser. #9J6288 SP, 55-ft. boom w/1 ea. ¾-yd. & 1-yd. buckets, 24" tracks. Extra parts. Located at Dist. Pumping Plant, 22 mi. S.W. of Williston, N. D. Bids to be opened at Project Office, Sept. 8, 1959. Certified check for 5% of bid to accompany bid, said check will be returned if bidder not awarded purchase. Payment in full required before removal of equipment. Thirty days allowed for removal. Board reserves right to reject any or all bids.

BUFORD-TRENTON IRRIGATION DISTRICT
P. O. Box 27 Trenton, N. D.

Lorain TL-20 comb. shovel, dragline, backhoe with Cat D311 engine. Serial #18422. Price F.O.B. Greensboro, N. C. $10,500.
Northwest model 80-D shovel with Murphy model 21 diesel engine. Serial #13119. Price F.O.B. White Haven, Pa. $29,000.

E. F. CRAVEN CO.
Greensboro, N.C.

MISCELLANEOUS EQUIPMENT

200 Tons of pick steels, rock drills, tractor spares 50% of list price.
MERTON ENGINEERING CO., LTD.
Feltham, Middlesex, England

MISCELLANEOUS EQUIPMENT

Caterpillar model D8 diesel tractor, serial 2U-20641SP, equipped with Gardner-Denver model WH600 tractor mounted compressor, Gardner-Denver model JMA hydraulic pump, Gardner-Denver model JTB tripod type boom, two (2) Gardner-Denver model D99DT derrick type drill, Gardner-Denver chain feed mountings, with 7" cone for 12 ft. steel changes, electric starting, crankcase guard, dry type air cleaner. Machine in excellent condition. $24,500.
Caterpillar model D8 diesel tractor, serial 13A-997, equipped with Caterpillar model 8U Universal cable controlled bulldozer, Caterpillar model 25 rear mounted double drum cable control unit, electric starting, lights, crankcase guard, track roller guards, oil clutch, dry type air cleaner. Tractor in excellent condition. $19,500.
Caterpillar model D7 diesel tractor, serial 3T-7402, equipped with LeTourneau angle blade bulldozer, Gar Wood model CCU-2 rear mounted double drum cable control unit, serial 22766, roller guards, large front idlers, seven roller track frame. Good condition. $8,500.
Caterpillar model DW10 diesel tractor, serial 1V-2740SP, equipped with Caterpillar model 15 scraper, serial 4W-5359, Caterpillar model 21 cable control, serial 5C-4137, electric starting, power steering, air brakes, lights, 12:00x20 tires front and 21:00x25 rear on tractor, 21:00x 25 tires on scraper. Price on application.
Caterpillar model DW10 diesel tractor, serial 1V-2769-SP, equipped with Caterpillar model 15 scraper, serial 4W-5397, Caterpillar model 21 cable control, serial 5C-4160, electric starting, power steering, air brakes, 12:00x20 front and 21:00x25 rear tires on tractor, 21:00x25 tires on scraper. Price on application.
Essick model 800 (5-8 ton) tandem road roller, serial U-3536, equipped with 53" diam. x 50" wide guide roll, sprinkling system, cocoa mats, hydraulic steering and powered by Chrysler water cooled gasoline engine. This roller has not had very much use. $6,400.
LeTourneau model G6 cable operated scraper, serial No. 45-65, 6 cu. yd. capacity equipped with 10:00x20, 12 ply tires, front and rear. Fair condition. $1,750.
Bucyrus-Erie model 54-B shovel & crane combination, serial No. 77778, mounted on 30" standard flat pads, equipped with 80' crane boom, 20' jib, shovel front with 26' boom, 18' handle, 2¼-yd. dipper bucket, high gantry, running boards, counterweight, powered by Buda model 6DC-1879 diesel engine, serial No. 36869-F with electric starting, also has a Kohler light plant for electric lights. Good condition. Located: Gallup, N. M. $45,000.
Elgin model 30 street sweeper, serial 1748, powered by Hercules 6-cylinder water cooled gasoline engine, electric starting, lights, hydraulic steering, 9:00x20 tires. Fair condition with excellent tires. $3,000.
Elgin model 20 street sweeper, serial No. 1616, powered by Hercules 6-cylinder water cooled gasoline engine. Electric starting, lights, mechanical steering, 9:00x20 tires. Fair condition. $1,500.
Cedarapids model FA portable hot plant, serial 12045, equipped with 3x10 double deck vibrating screen with cover, mounted on steel truck frame with tandem axle equipped with 8:25x20 tires, front dolly with dual 10:00x20 tires, powered by Caterpillar model D318 diesel engine, serial 5V-7045, used Cedarapids model 5024 portable drier, mounted on steel truck frame with 8:25x20 dual tires, air brakes complete with burners, hot elevator, powered by Caterpillar model D315 diesel engine, serial 9S-5967, used Cedarapids model 60 SP dust collector, powered by International four cylinder diesel engine, used feeder, used Childers model C-100 skid mounted oil heater, with transfer pump, powered by gasoline engine, used cold elevator, all necessary chutes, tinware, (not including miscellaneous nuts, bolts, etc.) to put plant in operating condition. Plant in good condition. Located at Sante Fe, N. M. $45,000.

R. L. HARRISON CO., INC.
P. O. Box 1320 Albuquerque, N. M.

Schramm Roto drill mounted on 1959 International model RF192 truck complete w/210 feet of drill pipe and 6 6¾-in. tools. Machine only 4 months old. Excellent buy at $47,500.

—Write or Phone—
THOMAS J. STRANGES
St. Clairsville, Ohio Oxford 5-2360

MISCELLANEOUS EQUIPMENT

CRUSHERS

Cedar Rapids 18x36 variable twin jaw crusher mounted on semi-trailer with fifth wheel pin and 8 9:00x20 tires. Overall dimension, 41'x8' wide & 12' high. 4'x10' vibrating type scalping screen. 27' long x 30" belt discharge conveyor. IH UD-24 power unit is skid mounted and has outboard bearing. Overall condition is very good. U-389.

DITCHERS

Cleveland wheel ditcher "Baby Digger". S/N 306. Powered by Hercules gas engine. Has 4½-ft. digging depth. Good working condition. U-1. $1,450.

Parsons model 88 trench liner has 7" paddles on chains, 14" paddles on extra chain. Gas engine. Good condition. F.O.B. Idaho Falls, Idaho. U-373. $6,250.

Barber-Greene trencher with 5" cutting bits. Wisconsin gas engine. U-372. Bargain price. $3,750.

ASPHALT PAVERS

Adnun blacktop paver, S/N 1462. Has been repaired and is in good operating condition. U-5. $1,400.

Barber-Greene model 879-A Asphalt finisher. S/N 49-67. Powered by LeRoi gas engine. Has been completely rebuilt & is in excellent condition. U-70. $9,200.

SCRAPERS

International Payscraper model 2T-75. 55,000-lb. rated capacity and wide base tires. Excellent condition. U-135. $29,500.

Be-Ge ST-770 hydraulic scraper, 6-yds. struck capacity. Excellent condition. U-246. $2,975.

GRADER

Galion model 101 motor grader. Hydraulic steering. IH UD-14 diesel engine. Good condition. U-29. $3,950.

MISC.

Fruehauf trailer (remodeled army surplus) good condition. U-28. $1,250.

Carco model "J" logging winch. 1955 model, good as new. U-65. $2,100.

Joy heavy weight class 58-BH 7¼" blast hole drill, 1951 model. Bargain price. Inquire for further details.

Superior pipe tongs as good as new. U-176. $99.50.

Call, wire or write today for information about these and our many other items of good used equipment.

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 Salt Lake City, Utah
Phone: DAvis 2-1241 TWX No. SU-278

ENGINES

1—New unused Buda 6B273 6-cyl. 3¾ x 4½" fan to flywheel gasoline engine—serial 374583—1335 RPM no load—38.7 HP @ 1,200 RPM full load—F.O.B. Erie, Pa.

5—New unused Buda 6B230 6-cyl. 3⅞ x 4½" gasoline engines—1,325 RPM no load—29.8 HP @ 1,200 RPM full load—complete with radiator, Twin Disc power take off, electric starting and 6V battery—serial Nos. 374114, 374640, 374641, 375110 and 375112—F.O.B. Erie, Pa.

1—New unused Waukesha ICK 4-cyl. 2½ x 3½" gasoline starting engine—61 cu. in. displacement—serial 1029495—F.O.B. South Milwaukee, Wis.

1—Slightly used (about 200 hrs.) Continental ED-201 4-cyl. 3⅛ x 4⅜" diesel engine—naturally aspired—1,700 RPM no load—35.4 HP @ 1,600 RPM full load—complete with radiator, power take off, electric starter, chain sprocket & misc. control equipment—F.O.B. Evansville, Ind.

1—New unused IHC U-1 4-cyl. 2¾ x 2¾" gasoline power unit—fully enclosed—16.8 HP @ 2,500 RPM full load—59.5 cu. in. displacement—SAE #5 flywheel housing—less PTO—F.O.B. South Milwaukee, Wis.

1—Rebuilt IHC U-1 4-cyl. 2¾ x 2¾" (same as above)—never operated after rebuilt—F.O.B. South Milwaukee, Wis.

1—Used Cummins LRI-600 6-cyl. 7¼ x 10" diesel engine—serial 89420—good condition—suitable for 88B—F.O.B. San Francisco, Calif.

Above engines offered "as is", F.O.B. the indicated locations, subject to withdrawal or prior disposition. Will sacrifice for quick sale.

J. E. Smart
BUCYRUS-ERIE CO.
South Milwaukee, Wis.
Phone: SOuth 2-0900

Portable, all steel barge-mounted dredge, 18' x 56' barge, knocks down to 4 sections. 5 drum dredge hoist, model 600 Cummins diesel on 10" AMSCO pump. G-M 4-71 diesel operates generator and high pressure water pump. 36' ladder with rotary cutter. 1,500' of 10" pipe—more available. Rebuilt and guaranteed. Financing available. $37,500. Call:

J. P. WAITE, INC.
3304 W. Pierce St. Milwaukee, Wis.
EVergreen 4-1900

COMPRESSORS & AIR TOOLS

2—Gardner-Denver wagon drills, each have drifter part D99D. Both have 10' masts for 8' steel. Mounted on pneumatic tires. Located at Casper, Wyo. branch.

1—Chicago Pneumatic 365 RD2 portable, 4 pneumatic tires, machine in very good condition.

1—Ingersoll-Rand DR-315 portable, mounted on 4 pneumatic tires. Machine like new. Located at Casper, Wyo. branch.

EXCAVATORS

1—Bucyrus-Erie 38-B shovel or hoe powered with Cat engine. This machine has been thoroughly reconditioned in our shops. Located at Denver.

1—P&H crane mounted on 12-wheel Maxi carrier, powered by Waukesha gas engine, 60' boom. This machine is ideal for industrial application.

1—Koehring model 304 S/N 8204 equipped as a shovel; machine is in good operating condition. Located at Casper, Wyo. branch.

ASPHALT & CRUSHING EQUIPMENT

1—Universal jaw crusher 12"x36" with removable wedges allowing expansion to 15"x36". Located at Denver.

TRUCKS

6—WD60 Koehring dumptors S/N D-3651, D-3867, D-4202, D-4550, D-4551, D-4009, powered by GM diesel engines. These machines rate a very clean classification.

TRACTORS

1—Caterpillar D9, new in June 1958, equipped with push block. We have just put in new rails, pins and bushings. A chance to own a big tractor at a big savings. Located at Denver.

1—Allis-Chalmers HD20 equipped with Garwood angle dozer, rear push block. This machine has a new engine and torque converter. Located at Denver.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake St.
Denver 2, Colo.

DRAGLINE EQUIPMENT

Bucyrus-Erie 70'0" dragline equipment for 54-B (like new condition) including fairlead, lagging, high A frame and 10,000 pounds counterweight, less ropes or bucket. Will sell at sacrifice.

OSAGE COAL CO.
Mr. Joe Lake, Sup't
Steamboat Springs, Colo.

---

1 Model TD-6 International tractor dozer shovel, with Bucyrus-Erie front end loader, serial #50345. Price $1,500.

Joe Mesalam
Alexandria, Indiana

3—¾-cu. yd. type AX medium-duty dragline buckets. Complete with all fittings. Weight—950 lbs. ea. Reduced price—$620 ea. F.O.B. Evansville, Ind.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

1—2-cu. yd. type TS Hendrix medium-duty dragline bucket complete with all fittings. Weight—3,550 pounds. Reduced price—$1,500. F.O.B. Evansville, Ind.

BUCYRUS-ERIE CO.
South Milwaukee, Wis.

New—¾-cu. yd. type "BM" medium duty dragline buckets complete with all fittings. Weight—1,900 pounds each. Reduced price—$1,140 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE
South Milwaukee, Wis.

2—Joy 58BH rotary blast hole drills. 440-volt, 3-phase, 60-cycle electrical equipment. Both machines bought new 1951. Tools and spare parts available.

EXCAVATING ENGINEER
Box 3743
South Milwaukee, Wis.

Save 60% On Unused Government Surplus Attachments

6 Bucyrus-Erie 51-B 2-yd. hoe attachments.
15 Bucyrus-Erie 22-B shovel attachments.
10 Unit 1020 ¾-yd. hoe attachments.
15 American ¾-yd. fairleads
6 American ¾-yd. hoe attachments.
2 Marion 2-yd. hoe attachments.
Link-Belt HC70 hoe attachment.
Link-Belt LS85 shovel attachment.
4 Lorain 80, 82, 820 fairleads.
2 Marion 372 fairleads.
4 Bucyrus-Erie 22-B crane booms.
40 miscellaneous boom and sections for ¾ to 3-yd. machines.
Large stocks of various machines and attachments on hand at all times.

TESTA BROS., INC.
P. O. Box 30 Bedford, Ohio
BEdford 2-5151

Mayhew rotary air drill complete with Mayhew split shaft power take-off for powering drill unit from truck engine, enclosed chain driven power transfer case, three-speed transmission on rotary table drive, model 2003 rotary table, power-flo chain pulldown with 1½" pitch chains, double drum draw works with two CL-311 friction clutches, 31" mast raised and lowered with two hydraulic cylinders, hydraulic oil storage tank with strainer, Vickers oil pump, Vickers control valve, swivel and kelly head assembly (28,000 lb. capacity), 3¾"x23' fluted kelly bar, kelly head adapter, kelly adapter to drill pipe, kelly drive bushing, 2" pressure hose and standpipe to swivel, all cables, hoist plug, break out blocks (slips), model WCG Gardner-Denver compressor with air receiver, gage and pop-off valve, tachometer at rear of drill, 618 breakout wrench, clearance lights with conduit and reflectors installed on drill bed, drilling lights installed, unit primed and painted and mounted on Euclid model 27FD 2751 with HR Cummins diesel engine. Brake lock system installed. Price $15,000.

L. G. EVERIST, INC.
307 Poulton Bldg.
Sioux Falls, S. D.

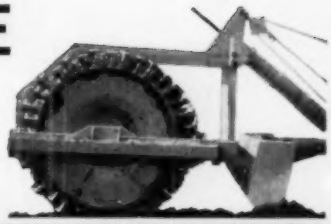
Notes . . .

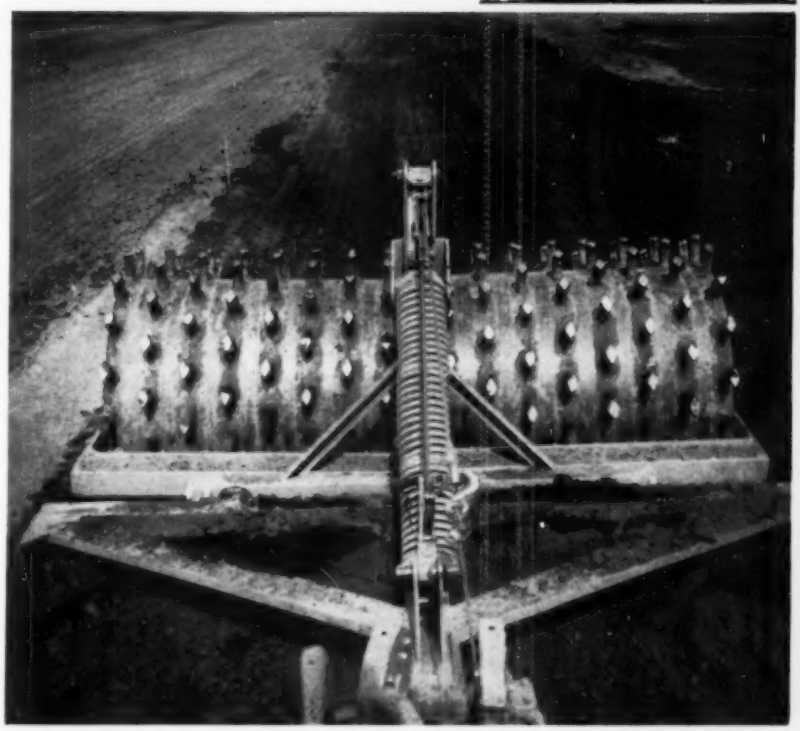
Continued from page 63

Maryland and Virginia. Blast hole drills handled by Gill Drilling Equipment Co. include the models 30-R, 40-R, 50-R, 22-T, 27-T, 29-T and 50-T.

Curtiss-Wright Corp., South Bend Div., South Bend, Ind., has appointed Aldridge-Harbour Equipment Co., Inc., Jackson, Miss., as a distributor in southern Mississippi. A combined 49 years of experience with construction machinery dealers is represented by the firm's president, E. C. Aldridge, and vice president and general manager, C. L. Harbour. Parts and service manager is J. L. Wallace. Located at 2901 Highway 80 West in Jackson, Aldridge-Harbour will provide sales, parts, shop and field service for Curtiss-Wright self-propelled and tractor-drawn scrapers ranging from 10 to 36 cubic yards heaped capacities, and rear dump models in sizes up to 35 tons.

LAST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





The BROS Leveling Tamping Roller* is such an uncomplicated piece of equipment that last year even big grading contractors like Alley Construction Co., of Faribault, Minn. couldn't quite visualize its real value on earthfill work.

But this year, Lloyd Parker, Alley's superintendent on the grading job for nearly a million yards at Wold-Chamberlain Airport in the Twin Cities, put a BROS G2 Roller-Level Blade combination on the job —the results were so good that he purchased a second unit the *very next day!*

You can easily see why: The Leveling Roller makes subgrade rolling a productive item because it produces uniform, proper densities faster than conventional tamping rollers can. The blade puts the materials into the voids, building a smooth, level course, permitting equal compaction pressure over the full width of the drum. Because the course is smooth and compaction is fast, scrapers can haul and spread at faster speeds, earning you greater profits.

The Leveling Blade has 14″ vertical adjustment which is controlled from the operator's seat by either hydraulic or cable control. The Leveling Roller is available in rolling capacities from 15,160 lbs. to 44,700 lbs. when roller drum is filled with wet sand.

*Patent Pending

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112″ width; 24″ height; and ½″ x 6″ double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141″ width; 31″ height; ⅝″ x 8″ square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

BROS

BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

SHEEPSFOOT TAMPERS

ROLL-O-PACTOR

BITUMINOUS CIRCULATOR

VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS

No. 955 excavates part of a total of 19,000 yd., preparing for base an area 20 ft. wide, 12-13 in. deep. Cuts are made by Cat No. 12 Motor Grader and windrowed. Job is part of a $1,828,366 project by Gulf Bitulithic Co. on U. S. 75, to be part of the Interstate Highway System.

Says Operator F. H. Leggett: "I can move over 100 cu. yd. a day more with the side dump than with other loaders. It doesn't spill dirt because you don't have to jockey for position. A Traxcavator is easy to operate and I'm less tired at night. It's the best on the market."

Weather bad... No. 955 terrific... job on schedule!

Bad weather cut work days during the first six months to 20 per cent, but the highway project stayed on schedule. Reason: a Caterpillar No. 955 Traxcavator with Side Dump Bucket.

Gulf Bitulithic Co., Houston, Texas, first tried a drag line on a 2½-mile widening job on U.S. 75 at Conroe, Texas. Production was poor in the shallow cut. Switching to a No. 955, five-yd. trucks were loaded in an average time of three minutes; four buckets to the truck.

"We increased production 25 per cent," says Superintendent Thomas "Red" Brown. "I like that Side Dump Bucket. You can't beat it!"

In-line loading of trucks with the Side Dump Bucket paid off in less traffic congestion on the busy highway, and it also avoided tearing up the subgrade with twisting and turning.

Side Dump Buckets are available on all three Traxcavators: No. 977 (2¼ cu. yd.), No. 955 (1⅝ cu. yd.) and No. 933 (1⅛ cu. yd.). Other buckets, teeth, 'dozers and forks help make a Traxcavator the most versatile excavator-loader.

Ask your Caterpillar Dealer to demonstrate on *your* job how a Traxcavator can make money for you. He stands behind every machine he sells with round-the-clock service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE